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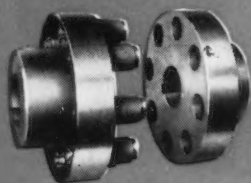
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FEBRUARY 20, 1941

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The Iron Age

FEB. 20, 1941

ESTABLISHED
1855



Savages

THE other day, I read a story about the early American Indians, who were referred to as "savages." It was an interesting story and told me some things that I did not know about these people who owned America before we took it away from them.

I learned that by and large, the various tribes lived amicably together before the white man took to stirring them up, that they were on the warpath much less frequently than we have supposed. And they never attacked an enemy until they had formally declared war on him.

Frequently tribes settled their differences "short of war" by playing a sort of football game between chosen teams. True, it was a pretty strenuous sort of football and no holds were barred, but at least the non-combatant spectators suffered no harm and decisions were abided by.

I learned also that these savages on the whole were quite religious; that they had but one wife at a time and did not practice divorce; that the death penalty awaited any tribesman who attacked a woman, that they did not touch alcohol until the white man taught them its virtues.

The term "savage" as applied to these people interested me so I looked in the dictionary to find its meaning. It told me that a savage was a person in an uncivilized state or condition. So then I had to turn to another page to find out what "civilized" meant. I then learned that a civilized person is one who has been reclaimed from a savage state or condition. (You see how useful it is to refer to the dictionary when you want enlightenment.)

Of course, the Indians had some vices. They smoked tobacco, did not care much for work, liked to gamble and loved to make speeches. But that did not give me an understanding of the difference between a savage and a civilized person, for more civilized people today are cultivating these habits.

I guess we will have to depend on actions and not words to find the difference between savage and civilized people. Civilized people differ from savages because they go to war without declaring it; they kill the men, women and children bystanders; they seize the lands and property of weaker nations; they disregard treaties and break them at will and they enslave the tribes that they capture.

One thing I forgot to mention. Wealthy Indians who had several blankets and were entertaining friends sometimes burned a blanket just to show how little they cared for property and how well off they were. But there is no record of their ever having destroyed billions of dollars worth of their wealth at one time.

The poor benighted Indians. Isn't it good that we civilized them?

J. H. H. H. H. H.

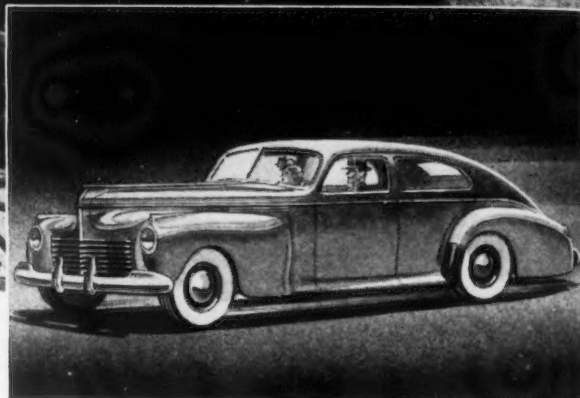


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41 Lessons in ARC WELDING

WITH industry now hiring men in wholesale lots, there is dire need for instruction material. This is particularly true in the welding field. THE IRON AGE, therefore, is pleased to present these lessons in arc welding, which will run in successive issues until the series is completed. This material was prepared by experts of the Westinghouse Electric & Mfg. Co., East Pittsburgh, and for that reason the proprietary Flex Arc equipment is specified.

These lessons are to enable a beginner to become familiar with welding fundamentals. Both bare and shielded-arc types of welding are considered, the bare being considered first because it is more difficult to use in some cases and gives students a better knowledge of the importance of melting the parent metal in order to obtain complete fusion. Once a welder has mastered bare electrode welding it is an easy matter for him to master shielded-arc electrode welding.

o o o

LESSON No. 1: *Object is to study the art of striking the arc and depositing short beads of weld metal.*

Apparatus used is Flex Arc welding machine, chisel, hammer, and wire scratch brush. Material is steel plate $\frac{1}{4}$ in. or heavier, and $\frac{5}{32}$ -in. diameter Flex Arc welding electrodes.

INSTRUCTIONS: The welding arc is established by touching the plate with the electrode and immediately withdrawing the electrode a short distance. At the instant the electrode touches the plate a rush of current flows through the point of contact, which is small because of the surface irregularities of the plate and the electrode. This electrical current causes the metals to melt at the point of contact and unless the electrode is immediately

withdrawn it will stick to the work. In case sticking does occur the electrode should be quickly moved back and forth to free it. If it is impossible to free the electrode by this procedure, the electrode holder should be removed from the electrode or the welding machine shut off.

Two methods may be used to strike the arc—a vertical up and down or a side scratching motion. The vertical method is illustrated in Fig. 1-a and is commonly used by experienced welders but often presents trouble to the beginner by sticking. The scratch method of striking the arc is illustrated in Fig. 1-b and consists of an uninterrupted motion of the electrode. The electrode is moved downward toward the work through a long arc and immediately after it scratches

the plate surface the radius of the arc is shortened, thereby withdrawing the electrode and establishing the arc.

After the arc is established it is necessary to move the electrode downward at a uniformly continuous rate to compensate for the part that is melted away. If this is not done the arc length will become too great to facilitate good welding.

In order to make a weld it is necessary to melt the work so that the molten metal coming from the electrode will fuse to it. The high temperature of the arc (approximately 6000 deg. F.) causes the steel to melt almost instantaneously; consequently, the surface of the work at the terminal of the arc will melt within a few seconds after the arc is struck.

After striking the arc, the electrode should be held at the starting point for a short period of time to allow fusion to occur. After fusion occurs the electrode may be advanced along the desired line of weld by holding it at an angle of about 15 deg. with the vertical (See Fig. 2) thereby depositing a bead of weld metal. The rate of advance must be timed to allow the work to melt and proper fusion to be obtained. In depositing a bead of weld metal it is necessary to advance along the line of weld at a uniform rate of speed to insure a

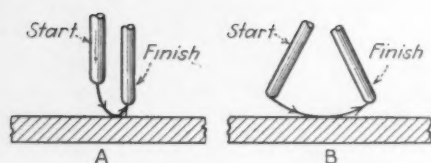


FIG. 1—Two methods may be used to strike the arc—a vertical up and down (left) or a side scratching motion (right).

smooth uniform deposit. Too fast a rate of advance will make a thin irregular bead with questionable fusion. Too slow a rate of advance may produce overlap at the edges of the bead as shown in Fig. 3.

PROCEDURE: Set the polarity reversing switch on straight polarity, adjust the current to 150 amp. and place the plate to be welded flat on the welding table.

(1) Practice striking the arc by using both methods until the arc can be struck at any desired point without sticking of the electrode occurring.

(2) After the art of striking the arc is mastered, deposit short beads (4 in. to 6 in. long) by advancing from the left to the right. Hold a short arc (about $\frac{1}{8}$ in.). The proper arc length can be determined by the regular crackling sound which is characteristic of a short arc on bare type electrodes. Examine the beads for uniformity, overlap and good fusion. It is often desirable to chip a bead off, especially the starting end, to study the degree of fusion obtained.

(3) Deposit short beads (4 in. to 6 in. long) from right to left. Examine for quality.

(4) Deposit short beads (4 in. to 6 in. long) by advancing away from the operator. Examine for quality.

(5) Deposit short beads (4 in. to 6 in. long) by advancing toward the operator. Examine for quality.

(6) After satisfactory beads can be made in all four directions, make a test plate as shown in Fig. 4.

LESSON No. 2: Object is to study the method of making continuous horizontal beads and filling craters.

Apparatus used is Flex Arc welding machine, chisel, hammer, and wire scratch brush. Material used

is steel plate $\frac{1}{4}$ in. or heavier, and $\frac{5}{32}$ in. diameter Flex Arc welding electrodes.

INSTRUCTIONS: Withdrawal of the welding electrode from the molten pool and breaking the arc results in immediate cooling of the molten metal. This cooling is accompanied by considerable shrinkage and the formation of a depression known as a crater. The shape and depth of a crater are dependent upon the type of electrode used, the polarity of the welding circuit, the welding current, the heat of the work and the manner in which the arc is broken. When welding with

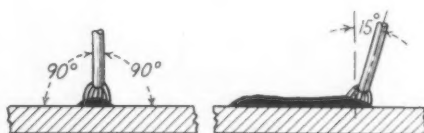


FIG. 2—A bead of weld metal is deposited by advancing the electrode along a desired line at an angle of about 15 deg. with the vertical.

bare type electrodes using straight polarity, a deep crater is usually formed and this crater may be used as a good guide to the depth of penetration, as shown in Fig. 5.

If the arc is broken either accidentally or to change electrodes, a special procedure must be employed to insure complete fusion and uniform appearance. In such cases the arc should be restruck at the forward end of the crater, moved backward across the crater, and then forward again and the welding continued, as shown in Fig. 6.

At the end of a weld it is often desirable to eliminate the presence of a crater. This is accomplished by choking or shortening the arc and holding it at the end of the weld until the crater is filled. By choking the arc so short that it is shorted out occasionally, there will be sufficient energy to deposit a small amount of metal but not enough to form a crater.

PROCEDURE: Set the polarity reversing switch on straight polarity, adjust the welding current to 150 amp. and place the plate to be welded flat on the welding table.

(1) Practice breaking the arc

while depositing a bead of weld metal and note the formation of the crater. Change the setting of the machine to 130 and 170 amp. and note the difference in the depth of the crater.

(2) Practice the procedure outlined in the lesson for restriking the arc to continue the deposition of a bead. Continue this until it is possible to make a uniform joint without excessive deposits of metal. Do not fill the craters if the weld is to be continued as this will foster poor fusion and produce a hump in the bead. Chip the joint to study the degree of fusion obtained.

(3) Practice stopping and continuing beads that are deposited in all four directions; to the right, to the left, away from and toward the operator.

(4) Practice choking the arc to fill the crater.

(5) After the art of restriking the arc and filling the crater have been mastered, make a test plate as shown in Fig. 7.

LESSON No. 3: Object is to acquaint the student with the effect of different arc lengths, welding currents and polarity on the resultant weld deposits.

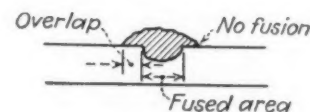


FIG. 3—Too slow rate of advance of the electrode may produce overlap at the edges of the bead.

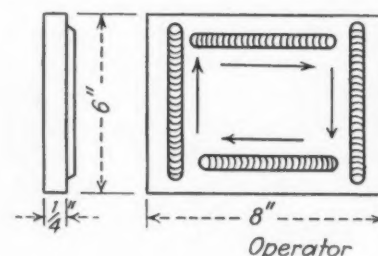


FIG. 4—After satisfactory beads can be made in four directions, this type of test plate can be prepared.

Apparatus used is Flex Arc welding machine, chisel, hammer, and wire scratch brush. Material used is steel plate $\frac{1}{4}$ in. or heavier, $\frac{1}{8}$, $\frac{5}{32}$ and $\frac{3}{16}$ Flex Arc welding electrodes and $\frac{3}{8}$ in. carbon electrode.

INSTRUCTIONS: In order to obtain the most satisfactory weld it is important to maintain the proper arc length and use the proper welding current. A short arc corresponding to an arc voltage of 14 to 22 volts is recommended for bare type electrodes. The proper arc length is recognized when welding by its characteristic crackling sound. Such an arc concentrates the heat at the plate, prevents excessive contamination from the atmosphere and results in more even and uniform fusion. The long arc results in poor fusion, highly oxidized deposits, excessive splatter, overlap and non-uniform fusion. The arc is erratic and large globules are formed at the terminal of the welding electrode.

The proper welding current for a given type of electrode will depend upon the electrode diameter, the joint design, the size of the plate being welded and the position of the welding. (Only horizontal or downhand welding will be considered in this lesson.) Because of this fact a range of welding currents are generally recommended for each diameter of electrode. Recommended current values are given in Table I.

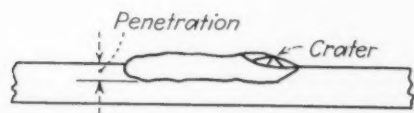


FIG. 5—Crater formed may be used as a guide to the depth of penetration.

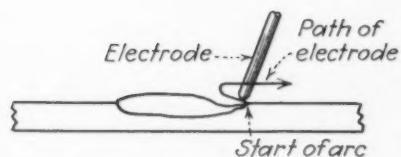


FIG. 6—If arc is broken this procedure should be followed to insure complete fusion and uniform appearance.

TABLE I.
Current Values for Flex Arc Electrode, Horizontal Position

Electrode Diameter, In.	Welding Current, Amp.
$\frac{1}{6}$	30-60
$\frac{3}{32}$	50-100
$\frac{1}{8}$	80-135
$\frac{5}{32}$	110-180
$\frac{3}{16}$	150-220
$\frac{1}{4}$	200-300

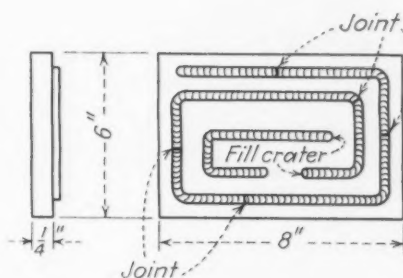


FIG. 7—After art of restriking the arc and filling the crater have been mastered, this type of test plate should be made.

The proper welding current for a given set of conditions can be determined from the degree of heating of the plate being welded and the electrode. If the electrode becomes red hot it is an indication that the welding current is too high. Satisfactory welds cannot be made with a red hot electrode. If the plate or work heat excessively, oxidized and unsatisfactory welds will be obtained. In such cases reduce the welding current or change to a smaller diameter electrode.

The proper polarity of the welding circuit is essential when welding for the best results. In many cases the wrong polarity results in an erratic or wild arc which makes welding difficult and the resultant weld unsatisfactory from the standpoint of quality, fusion and appearance. Flex Arc bare type electrodes should be used on straight polarity (electrode negative and work positive), the polarity reversing switch on the welder automatically adjusts the polarity, consequently the student will have no trouble in determining the polarity of the circuit. It is desirable however for every welder to be able to check the polarity if it is questioned.

The easiest way to check polarity is to use a volt or ammeter, but in

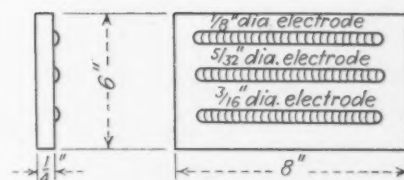


FIG. 8—This type of test plate should be made to determine best arc length and welding current.

most cases such instruments are not available. An equally reliable method of checking polarity by using the carbon arc has been developed, therefore. If an arc is drawn between a carbon electrode and a steel plate and straight polarity is used, the arc may be moved rapidly from place to place or drawn out to great length without becoming extinguished. If, however, reverse polarity is used it will be found that the arc may easily be extinguished by a sudden motion of the carbon electrode.

PROCEDURE: Set the polarity reversing switch on straight polarity and place the plate to be welded flat on the welding bench.

(1) Deposit beads with $\frac{5}{32}$ -in. diameter electrode by varying the welding current from 110 to 185 amp. Examine the appearance of the beads and note the heating of the electrode and plate. Adjust the welding current to 150 amp. and deposit beads by using a long and short arc. Examine beads for uniformity fusion, spatter, etc.

(2) Deposit beads with $\frac{1}{8}$ -in. diameter electrodes by varying the current from 85 to 130 amp. Adjust the welding current to 120 amp. and deposit beads by using a long and short arc. Make notations as above.

(3) Deposit beads with $\frac{3}{16}$ -in. diameter electrodes by varying the welding current from 150 to 220 amp. Adjust the welding current to 180 amp. and deposit beads by using a long and short arc. Make notations as above.

(4) Use a carbon arc and study the method discussed to check polarity.

(5) Make a test plate as shown in Fig. 8 with $\frac{1}{8}$, $\frac{5}{32}$ and $\frac{3}{16}$ electrodes by using the best arc length and welding current as obtained from the previous exercises.

Ed. Note:—Next week these lesson in arc welding will be continued.



After It's

TODAY we are all of us desperately concerned with the outcome of the war in Europe. And, today we are all of us equally concerned with the swiftest possible progress of national defense in the United States.

But some day—somehow—the war will be over.

Whether the United States takes part in this war, or whether it does not—whether England wins or England loses—whether Germany remains a totalitarian state under Hitler or whether it does not—whether Italy folds up or continues—whether Japan conquers or retreats—whether China survives or fails—whether Russia acts or remains inscrutable—

Some day, the present conflict will be over. It is simply a matter of history that peace follows war. And when this peace comes, just where will we be, in these United States?

After the last war, industries built up for war and national defense plunged into inaction and unemployment when the emergency was over. Then this inaction and unemployment were reversed, not long after the conclusion of the war, due to the tremendous needs for the reconstruction of the European countries which had been at war. The United States

was called upon to furnish a mighty volume of machines and materials for the rebuilding of France, Germany, England and the other contestants.

The post-war period proved to be a tremendous opportunity for the export trade of the United States. This trend was so powerful that this country did not actually realize its true post-war depression until 1930-1934.

Will history repeat itself in connection with the present war? In my opinion the answer is "no."

In the first place, at the end of the last war the European countries involved, both the victors and the vanquished, still had a certain degree of credit and buying power. Will any of the countries of Europe have substantial credit or buying power left in the face of the total destruction which is going on today? Certainly they will not have the capacity for reasonably swift reconstruction, and reasonable immediate financing for national needs, such as followed the last war. In short, it is doubtful whether we can regard England and the continental countries as potential large scale buyers directly this war is over.

Of course, it is possible to take an optimistic viewpoint. It is easy to say that after the war is over,

the countries of Europe, regardless of their financial status, simply *must* have the fruits of America's industrial progress. They will need our products as they have never needed them before. The very extent of the destruction which has taken place in their territories will be the measure of the demand which they will make upon American industry for reconstruction purposes.

This is a very pretty theory. It might be true if circumstances remained the same as they were at the end of the last war. But circumstances are far different.

At the end of the last war, mechanization and technological improvements, both in England and on the Continent, were far behind those in the United States.

Processes of manufacture of automobiles, of airplanes, of machine tools, of steel—in fact, of almost all of the requirements of our modern civilization—were literally in their infancy by comparison to methods currently in use in this country.

Different Situation Now

But that has changed since the last war.

Germany, under Hitler, has used much the same type of efficient, mass-production methods that we have used in this country. Under the spur of war necessity, England, although by no means as far along in this respect as is the United States, has made tremendous advances. Although France bogged down completely in the utilization of modern productive processes, nevertheless her factories and her methods are today much closer to those of the United States than was the case at the end of the last war. Meanwhile, we must not forget that in Czechoslovakia there exist modern, mass-production facilities. And the United States has even helped

All Over

By E. J. KULAS

President, Otis Steel Co., and Midland
Steel Products Co., Cleveland

to educate Russia in the art of mass production.

Since the last war—especially in the last few years—vast quantities of American-made machinery and productive equipment have been shipped abroad. Most of this has gone to England. But a large share has gone to France and other Continental countries, and some to Russia.

Meanwhile, particularly in Germany and in England, manufacturers of metal working equipment have made tremendous strides. Much of the machine tool and other equipment today turned out by English and German factories is, in terms of actual performance, almost as good as that produced by United States manufacturers.

This whole picture may be summed up in the simple statement that whereas at the end of the last war the United States had equipment far superior to the rest of the world, today the rest of the world, especially Europe, has manufacturing equipment which is at least able to compete, and compete seriously, with that of the United States. It is quite beside the point that the United States has furnished many European countries with much of this equipment.

Neither do we have any firm grounds for assuming that by the time the war is over, most of this equipment will have been bombed out of existence. It is more probable that much of this equipment is going underground—to be brought out and put to work the minute peace has been declared.

And where are we going to be in this country when that happens? Certainly we are *not going to be* where we were at the end of the last World War. In fact, the situation may be just the reverse.

Instead of buying from the United States, it may well be that foreign countries, possessing ex-

cellent production facilities, faced with bankruptcy and in urgent need of outside income, and supplied with vast reservoirs of low-wage labor released from armies, will do their utmost to produce for export and undersell the United States in world markets. In fact, they may actually be able to invade our domestic markets, in spite of high tariffs, because of minimum labor costs plus depreciated currencies.

What are we going to do to meet this contingency?

Can it be met by an over-extension of productive capacity, in steel or in any other industry, beyond all possible needs for war or peace, on grounds of national defense?

Can it be met by an advancing spiral of prices and wages which might leave us, when the war suddenly ended, hanging high and dry, with both wages and prices so far above world levels that we could not possibly compete in foreign markets and might even be undersold at home?

A tremendous boom in plant building and equipment buying, in wages and prices, which later turned out to be unjustified by relationship to actual defense needs, might be well nigh fatal.

The intelligent procedure would certainly be one of estimating carefully the productive capacity of existing facilities, not only in steel but in all industries connected with national defense—and then determining how such existing facilities can best be allocated toward fulfilling both the needs of national defense and normal domestic requirements. Only if and when such estimates indicate the need for additional facilities should those facilities be constructed.

Of course, there should be no stinting nor holding back in any

department of industry where more plant actually is needed to do the defense job. That is the position of the steel industry which in the years 1940-41 increased its open hearth ingot capacity by about 2,000,000 tons and its electric furnace capacity by 50 per cent.

Strenuous Competition Coming

The next post-war period may well be a period of the most strenuous competition for national and international markets that this world has ever seen. Certainly we cannot compete if we over-build and over-expand at today's cost levels and proceed blindly toward the armistice-day precipice of chopped-off defense orders and tobogganing prices.

The problem is to push defense production to the limit—it is all-important now—but at the same time not to undermine our own economy in the process.

We must not completely forget tomorrow's markets—both in the United States and in all of the other countries of the world.

We must begin to consider right now the type of products which we are going to sell to the people of the United States, and to people the world over, after this conflict has ended. We must be prepared, when that moment comes, to offer not only the people of this country but the people of all the world more value for less money.

Otherwise we simply will not be able to hold our own against the post-war competition which will develop from European post-war countries equipped with modern machinery and manned with ex-army personnel willing to work for minimum wages.

How can we prepare for this inevitable situation? Past industrial history has already pointed the answer. The industrial supremacy

of the United States has been built upon its continuing capacity to give more people better products at lower prices. We have constantly passed on to the public the benefits of mass production—on the principle that greater markets make possible the making of a better product at lower costs, and vice versa.

This, I believe, is exactly the theory which we must pursue and must maintain in order to preserve the position of the United States in the international grab-bag for trade which will follow the declaration of peace.

But if we are to pursue this course successfully, it is time that we began doing some very careful thinking along this line, right now.

It is all too easy to worry, today, only about how we can meet our orders.

It is only too easy to forget research and invention—because there is no time today to bother with the possibilities of tomorrow.

But let me state most emphatically that in my opinion research and invention today constitute the most effective "hedge" we can possibly have against post-war conditions.

Andrew Carnegie once said, "Utilize dull times to build new plants. Work harder than ever when business falls off, to be ready for the next peak, for in this country the next one is always higher than the last. When the rush comes, business flows naturally to the man who can make the deliveries."

All that is true. The steel industry has utilized the last seven years to build new plants. It has prepared itself for the rush which has come today.

But at the same time, may I suggest a corollary to Mr. Carnegie's statement? I would say, "Utilize rush times for research. Work harder than ever, when demand is high, to develop and to test new steels and new applications of steel, to be ready for the next depression. For in this country the next depression may be worse than the last. In pulling out of a depression, business flows naturally to the man who has the best and newest products at the lowest price."

The next depression? It seems all too obvious that this is in the offing when the defense (or war) program is over. And in the international competition which ensues, this country can win only if it continues to maintain the same ascendancy in ingenuity that it has maintained throughout the world's industrial history.

The United States has always been ahead in research, in invention, and in development. I believe firmly that the United States can, and will, continue to be ahead in research, in invention, and in development.

In spite of the fact that England and Continental Europe have in recent years come closer to American productive efficiency and design than has ever been the case before, the fact still remains that they have never yet, on the

average, approached American standards.

Our job is to progress so far in research, invention and development that when this war is over we will still be out front in these respects.

This is the only chance we have of protecting ourselves against the inroads of world competition after the war is over. We must be able to make better products, newer products, by better and cheaper methods. I believe we can do it. It is in line with all the past performance of the United States. And we dare not forget this objective in order to produce today in a hurry all of the various items needed for national defense.

On a long-term basis, national defense for the United States is by no means a matter of purely military preparedness. It is equally a matter of economic preparedness. And long-term preparedness, from the economic point of view, must take into consideration post-war as well as present conditions. History has shown time and again that the final outcome of an international situation is often predicated far more upon economics than upon battles.

If the United States can keep itself prepared not only for military defense but for international competition, we will have achieved the degree of total preparedness which, in my opinion, is necessary to hold our proper place in the world, not merely in the face of today's unpredictable conflict but also in the years which will follow thereafter.

Improved Rod Straightener and Burnisher

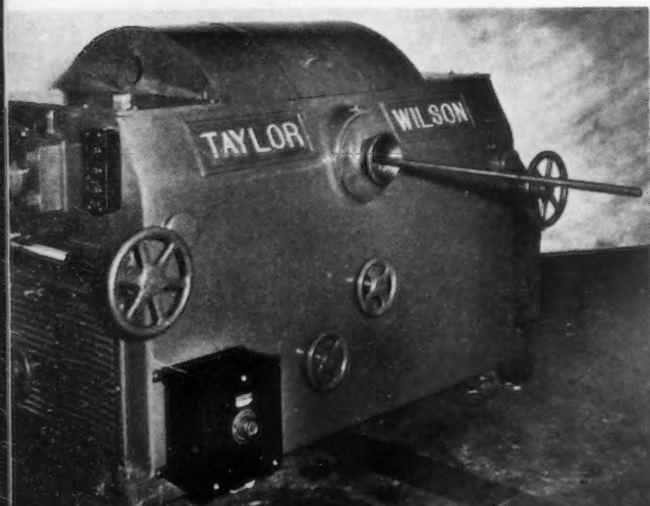
REPRESENTING an evolution in a small size straightening, sizing, and burnishing machine for rod announced about a year ago by

Taylor Wilson Mfg. Co., McKees Rocks, Pa., Nos. 2 and 2A machines have been added to the line. The newest additions are larger sizes than the one announced a year ago and plans are already formulated for the subsequent manufacture of a third and larger unit.

The No. 2 machine will handle bars from $\frac{1}{4}$ to $1\frac{1}{2}$ in. and tubes $\frac{1}{4}$ to $1\frac{3}{4}$ in., while the No. 2A will handle bars

from $\frac{1}{4}$ to 2 in. The speed of these machines runs from 66 to 200 ft. per min., the driving motors being 25 and 40 hp., respectively.

Overall floor space is 8 ft. $8\frac{3}{4}$ in. x 8 ft. 3 in. These machines are being utilized for airplane tubing and boiler tubing for national defense projects as well as for the general run of accurate cold drawing requirements. The manufacturer of this rod straightener emphasizes fast roll change, quick, positive setup, as well as high production speeds.



Material Standardization

—The how and why of materials standardization, which is particularly timely in this critical industrial period. Includes purchase specifications, scope of standardization, standards department and committees, executive control, etc.

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THE orderly employment of standardization and simplification processes in industry is regarded by economists and engineers as one of the important approaches to increased savings and manufacturing expediency, and in addition to enhancement of the performance or permanence of the product. Furthermore, when these processes are carried to their logical limits, mass production in factory operation can be accomplished to best advantage. For the latter reason, this subject is of particular moment, since standardization is expected to play a vital role in attaining quantity production in the current national defense program.

The theme of this paper concerns a valuable aspect of industrial standardization and an essential of scientific management, namely the process for standardizing engineering and manufacturing materials within an industrial enterprise. Manufacturing materials are a major item in the cost of production, a fact illustrated by data collected and published by the

U. S. Census Bureau, which show that in industry as a whole approximately 50c. of the manufacturer's dollar is spent for their purchase alone. Therefore, a systematic company standardization procedure, which assures the economical and effective utilization of manufacturing materials is a matter of primary importance.

Standardization has come about through a more or less evolutionary process. The current attention to material standardization in industry does not represent, therefore, something new, but is rather an awakening to the necessity for the constant systematic and rational questioning of existing standards, perhaps unconsciously accepted by imitation and tradition, and the adoption of new and valid standards. It is now an axiom of scientific management that every enterprise in industry should establish and adhere to a definite organization and a sound method of development in order to achieve the desired results with a minimum of energy. The type of organization required, and a set of prin-

ciples of practice are becoming standardized gradually, though varying somewhat according to the size, scope, and nature of the business.

Standardization Elements

Modern material standardization involves functions which are not always fully understood. Therefore, perhaps it will be of help in the further consideration of this question to define what is understood by the term. Material standardization is broadly described as both a technical and creative as well as a commercial and selective function. Standardization, in its strict sense, actually concerns the development, publication, and maintenance, in use and practice, of material standards, purchase specifications, and engineering data, together with ordering, cost, and stock data. The technical and creative work involves the determination by engineers of the best materials to meet a required performance, and the specification characteristics which indicate their quality or performance.

No exact line of demarcation

can be drawn between the technical and commercial functions, for they overlap in some respects. The commercial and selective work, widely known as simplification, which is actually an elementary or preliminary form of standardization, involves the determination of the optimum or most favorable number of standards. In practically all cases, it means a selection from existing standards of those which are most important and thereby a reduction in the variety of these standards.

MATERIAL STANDARDS: A material standard is defined as that material which is at any given time the best and most economical quality, form, and size for the service required, or is a reasonably attainable maximum of desirability. It is established by general consent as a result of engineering study combined with experienced operation.

PURCHASE SPECIFICATIONS: The material or purchase specification is an essential part of the standardization program. It is the medium for expressing each material standard listed in the inventory classification so that it may be clearly understood by the vendor, the buyer, the inspector, and the user.

The specification is not to be treated as a legal document and thus as a means of protecting the consumer, although it may be made the basis for a legal contract. The producer wants to supply what the consumer needs, and the specification is an effort on the part of the consumer to tell what he wants, and also a mutual agreement between the producer and consumer as to what the material shall be.

In the main, purchase specifications are simply complete, systematically written descriptions of the material to be purchased, sufficiently accurate and definite to insure receipt, at the least cost, of the quality required for satisfactory use. The specification begins with the name of the material, the materials symbol, and a statement of the uses for which it is intended. It contains carefully prepared statements in measurable terms of chemical analysis, physical properties, and dimensions, including methods of tests and sampling together with other qualities such as form, finish, and manufacture. All of this is presented in such a manner as to permit checking the requirements set forth and

to allow of acceptance or rejection on the basis of such specifications. Full advantage is taken in the preparation of the specification, of the engineering research and study required in determining the qualities that the material standard should have.

Consumer purchase specifications are prepared and utilized, as a supplement to technical society or government bureau specifications, since the use of the latter, within company organizations ordinarily involves some interpretation or condensation. At all times, however, the basic quality requirements and methods of tests of available standard specifications should be followed for best results. National specifications, just because they are meant to cover the needs of a whole range of industries, are of necessity highly generalized, treating types, grades, finishes, tolerances, and other properties so comprehensively as to be unsuited and not completely adapted to the particular requirements of a single company. Furthermore, they can not obviously cover, at all, individual company instructions for packing, marking, and rejection. Company specifications are prepared, therefore, because it is desirable to publish only its limited standard requirements, together with its own peculiar instructions. Another important reason for the necessity of company specifications involves the identification of materials on drawings, correspondence, and records by the company's material symbol.

STANDARDS CATALOG DATA: It should be understood that primarily the specification covers the purchase requirements to the vendor and provides for the inspection department, a basis for inspection. The purchase specification is not expected to serve added functions for which it is not suited.

Maximum benefits to a manufacturing material consumer are obtained by issuing separately, within the company, information regarding the materials in which it is interested and of sufficient value to warrant publication. Instead of the purchase requirements, a so-called standards catalog, covering (a) engineering data and (b) ordering, cost, and stock data, is issued to responsible parties in the engineering, purchasing, production, ordering, and stores departments, tool and heat treating rooms, and others who have use for them.

The standards catalog performs the following functions:

ENGINEERING DATA:

(a) Presents the recommended standard materials sponsored by the company technical committees. Includes a code index which identifies company specification symbols used on drawings, requisitions, etc., thus establishing standard nomenclature describing each material.

(b) For assistance in selecting and utilizing standard manufacturing materials, gives comparative data as to the engineering requirements set forth in the specifications, properties, practices of the trade, size tolerances, recommended applications, and precautions to be observed in the use of the materials. Also included are heat treating, finishing, and other processing specifications.

ORDERING, COST AND STOCK DATA:

(a) Indicates ordering methods which decrease price extras and lists the recommended standard order and ordering point. For assistance in requisitioning, outlines ordering form and gives example of sample order.

(b) Lists size, quantity and cutting extras, and presents other pertinent cost information as well as outlining the cost build-up of the material.

(c) Establishes standard and preferred standard material stock sizes together with their unit weight. Recorded separately is a list of any special works stock which is not for use on designs repetitively ordered as well as a list of any items carried in warehouse stocks which, once depleted, are not intended to be reordered.

The standards catalog is used also to list finished and semi-finished parts for maintenance and product, establishing standard nomenclature and including a brief description of each, together with the standard sizes and purchase quantities recommended by the company committees.

SCOPE OF MATERIALS STANDARDIZED: As a matter of policy, all manufacturing materials should be standardized, in order to achieve certain economies and simplify and clarify operations. In initiating a material standardization program within an enterprise, priority of standardization should be given to those materials when warranted:

(a) By their value or their

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In order to obtain their greatest effectiveness, specifications must be backed up by inspection. It should not be assumed that the reliability of proven sources of supply is a guarantee that specifications when accepted will be strictly followed.

o o o



quantity purchased, in order to eliminate the danger of appreciable monetary losses by not giving good results.

(b) By the necessity for unusually close control of their properties to assure continuous efficient processing or to protect the product in service.

Organization

Material standardization should be used as a tool in the organization's management to the extent that there is a special department keeping track of all possible opportunities to crystallize into company standards the experience and requirements of the various other departments. Therefore, it is usual for medium or large companies to create a material standards department, or an organization which corresponds to this when otherwise named, the principal function of which is to act as a coordinating force. The larger firms have branch bureaus in the separate departments or in the separate factories. Though the size of the department is dependent to a large extent upon the size and type of enterprise, it is practicable for any company to

assign at least one man to serve either whole or part time as the material standards department.

The department in a larger company is a technical bureau composed of a supervisor, engineers, clerks, and stenographers, and is delegated the authority for developing and maintaining material standardization. This involves the actual analysis, classification, and symbolization of inventory and the drafting and revision of purchase specifications and standards catalog data for manufacturing materials as well as for all other purchased materials.

It is required to choose, as personnel, engineers who have an unflinching amount of tact, with training both in research and in practical engineering, and who are familiar with the characteristics and service of all materials specified. They also must have a good general knowledge of the manufacture of materials with its limitations and difficulties as well as a thorough knowledge of tests and testing methods and their relation to service quality.

The superintendent of the stand-

ards department and perhaps some members of his staff should be given every opportunity to participate in national and trade association standardization. The contacts so made and information derived will be of inestimable value.

Standards Committees

Material standardization requires the pooling of all available knowledge on the subject concerned. But, since opinions are bound to differ, the procedure of handling standardization effectively, especially in large organizations, is by the use of the committee and conference method. In a small enterprise, however, the standardization engineer would do most of the work through personal contact rather than through committees.

There is a distinction to be drawn between the drafting of the specifications which state the required quality and the responsibility for determining the quality which is required. The authority for the first function, as has been mentioned, lies in the material standards department. In most companies, the responsibility for

quality decisions, however, is vested in material standards committees. Such committees hold meetings as required, requisition information deemed necessary, request tests and experiments if desirable, and after due deliberation make appropriate recommendations. The committees also determine the general methods of developing standards, approve requests for the inclusion of new materials and pass on recommendations that old materials be discontinued.

The typical material standards committee is composed of responsible members of the engineering, metallurgical, chemical, production, and purchasing departments. It also includes other interested technical representatives from organizations affected, such as the inspection, manufacturing, and stores departments together with a representative of the material standards department itself, acting in the capacity of secretary. The engineering, metallurgical, and chemical departments are able to contribute information concerning the characteristics the materials should have to meet the engineering requirements, the purchasing department regarding material costs and availability, and the production and manufacturing departments regarding the relative ease and satisfaction with which materials can be processed.

Such a committee will insure that material standardization will be handled from the standpoint of the organization as a whole rather than the immediate needs of any single division. Moreover, since those who are concerned with the materials are consulted in the preparation of the standards and specifications, the standardization when completed will be much more kindly received. Standardization is essentially a problem in cooperation, and it is particularly important that it be harmonious and helpful.

Executive Control

The material standards department must be neutral in its handling of the cases referred to it. Therefore, standardization together with research, engineering, and testing should be combined in a group of closely coordinated units independent of operating departments and should report for suitable supervision directly to a high ranking executive officer. In many large firms, the departments report

directly to the general manager, which is especially the case in German organization.

Where a number of separate plants are served by a central material standards department, an executive committee may be formed. It is comprised of officials, from the various plants affected, who are immediately concerned with either the production engineering or supply functions and, in addition, who are actively interested in material standardization in their own factories. The executive committee is organized as an advisory body to the management for the purpose of determining the objectives and policies of the program and supervising the work of the material standards department.

Members of the material standards committees are appointed by the aforementioned executive head or by executive committee members. Care should be taken that members of the standards committees have the authority to cast a definite vote on matters concerning their departments, and to effect, within their departments, the recommendations of the committee. Experience has shown that committees whose members do not have final authority in the disposition of materials have failed to accomplish maximum results. The executive head of the company should make it mandatory for standards committee members to attend the committee conferences.

If company standardization is to be successful, the management should from the beginning make it clear to everybody in the company that this work has its full support and that company standards once set up and put into effect are to be strictly observed.

In regard to decisions on manufacturing material quality, which affect the quality of the product, the problem pertains to general policies. Thus is required the careful attention of the top management who in consultation with the standards committee are likely to arrive at the wisest conclusion regarding product quality.

Cooperating Departments

PURCHASING DEPARTMENT AUTHORITY: The purchasing department exerts an important creative force in material standardization by cooperating in buying to standards and purchase specifications, by educating the producer, as well

as the engineering and requisitioning sources within its own plant, and by constructive suggestions and intelligent consideration of the standards and specifications.

It is usual practice in all concerns to give to the purchasing department the authority to question the quality of material standards. This department alone does not necessarily carry the authority to change standards or specifications, but merely to raise the question and to submit the final decision to whatever other department has been responsible for the initiation of the standard and its specification. This prerogative is to be expected, since the purchasing department is more apt to be conversant with the supplier's ability economically to meet the specification.

More important, however, is the fact that the supply function is always the responsibility of the purchasing department. Thus, if questionable quality requirements are not contested, resulting in poor delivery, high cost, or unusable quality, it is the purchasing department's responsibility to take care of the production requirements in the emergency created. For this reason, the buyer is expected to view the specification in its entirety, giving consideration not only to the technical or other requirements of quality, but to the possibility of fitting these requirements in with the standard practice of vendors or with the possibilities as to securing delivery or price concessions for slightly different quality requirements.

The purchasing department, by virtue of its central position, is also the chief agent for enforcing the standards program within the company. It has the direct responsibility of calling the attention of the using department and the standards committee involved, to the added expense resulting when the requisitioner calls for an article which is not standard. The requisition is checked by the purchasing department to see if it specifies a standard item, and if the copied description is the same as that in the catalog. If the material ordered is not standard, the requisition is returned with a request for the reasons necessitating special material. Forthcoming explanations are referred to the material standards department and the standards committee for their consideration.

INSPECTION DEPARTMENT: In order to obtain their greatest effectiveness, specifications must be backed up by inspection. It should not be assumed that the reliability of proven sources of supply is a guarantee that specifications when accepted will be strictly followed. Granting this intent in most cases, there always exists the possibility of errors in manufacturing or processing which are detectable only by test or inspection. Furthermore, in spite of all specifications and drawings, requirements may be mutually misunderstood and discrepancies may occur which will only be found on inspection. Purchaser's inspection and tests are also desirable because they help both sides to understand each other's viewpoints and help eliminate faults.

The extent, however, to which material should be subjected to inspection depends largely on its importance. If the material is ordered in large quantities or if its failure in service would mean costly delays in production or loss of life or money, then constant and rigid inspection should be employed. On relatively unimportant material

bought in small quantities, less frequent inspection is needed. For most materials, no more inspection is required than such mechanical tests as can be made by the inspector in connection with his examination for dimensions.

In some cases, inspection departments find it desirable to resort to chemical analysis and other time consuming tests. To the large corporation which maintains its own testing laboratory, these tests are a comparatively simple matter. The company which does not operate a laboratory, in order to properly check important materials, should use the services of outside testing laboratories. The outside laboratory selected for each test should be competent in the particular field in which the test is to be made.

It is the responsibility of the purchasing department in collaboration with the inspection department to enforce the specifications outside the company. As specifications are issued, the inspection department must be prepared to reject and return to the vendors material that does not meet specification requirements.

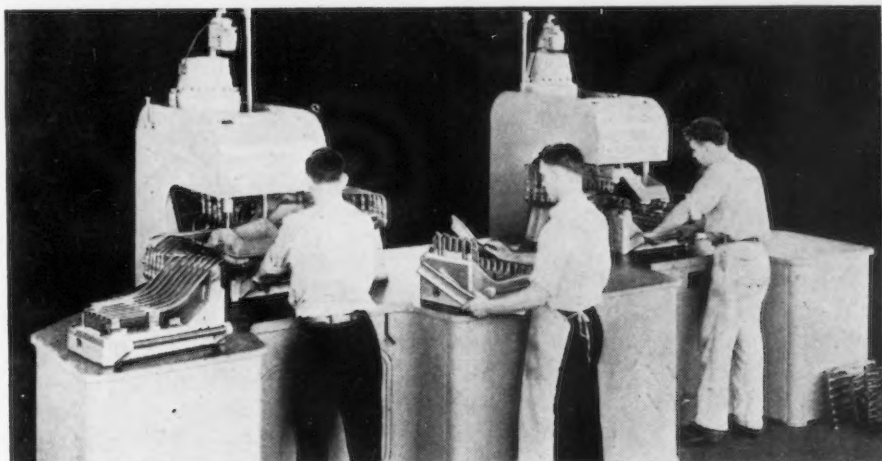
STORES DEPARTMENT: The stores department is frequently requested to aid in obtaining information concerning the material grades, forms, and sizes carried in stock. Though this function involves time and expense, the data obtained are a basic requirement of material standardization, and the ultimate saving to the stores department alone will far surpass the initial expenditure.

When material standards are changed, the existing stock of items made obsolete should, if practicable, be used before acquiring stock of the new standard, or steps should be taken for proper disposition. If immediate disposition is not obtained the stock keeper is usually allowed to scrap all material which has lain unused for a period of approximately two years. Materials for new work should not be ordered in advance of the preparation of plans or drawings except in unusual circumstances, as this is likely to result in obtaining material which cannot be used.

Ed. Note: Next week the author concludes this informative article with data on procedure for development of a material standardization process—as for instance, inventory analysis, research, committee conferences, enforcement, etc.

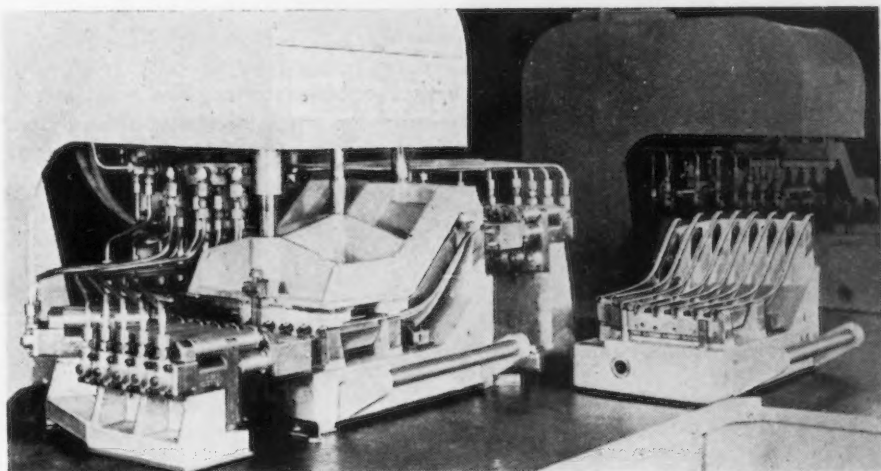
UPPER

UPWARDS of 4000 spot welds are made per hr. to assemble 1000 stampings into 100 automobile radiator grille halves on this novel equipment designed by Progressive Welder Co., Detroit. Unique jigs with rubber tired, spring mounted wheels facilitate rapid handling of parts in and out of welding position. Self-equalizing welding tips—two per gun—permit two welds per gun, again doubled by welding through two guns in series. Two welding stations (for right and left halves) with two men per station—each loading, welding and unloading work.



LOWER

ONE automobile radiator grille half jig clamped in welding position. The alternate jig is shown with welded part ready for rapid removal. Locating pins engage holes in jig after upper electrode wedges work in position and forces jig against table. There are 20 guns per station.



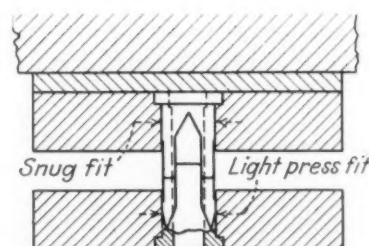
Small Holes Punched

PUNCHING of holes which formerly were considered drilling operations because the hole diameter was smaller than the material thickness is now made possible by a patented piercing punch made by the Durable Punch & Die Co., Chicago. Developed originally to go through metal as thick as the punch diameter, it has since been found that the punch will go through metal two and even three times the punch thickness. The photograph shows one hole punched in this manner in which the part thickness is some three times or more the diameter of the hole. Furthermore, the hole is clean cut throughout since the punch cuts all the way, instead of cutting through half way and breaking through the rest of the way, leaving a ragged surface.

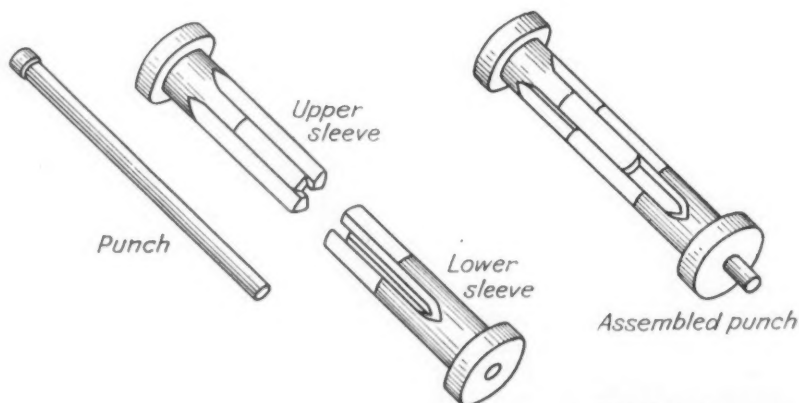
Tolerances on hole size can be held closer than for drilling, it is said. For example, one of these punches is meeting a tolerance of 0.0005 in. of dimension on a punched hole for a shaft bearing in a vending machine. This tolerance would be difficult to hold

with a drill, especially after a few grindings. The punch after re-grinding still holds its original size within a few ten thousandths. Another case of close work, done by a manufacturer of electrical instruments, was the reaming of holes where 0.0002 in. was declared to be too much of a variation and an exceptionally smooth inside wall was necessary. A "Durable" punch with burnish combined was constructed, and now the manufacturer gets better smoothness than obtained in the reamed hole, greater accuracy and at much less cost since the

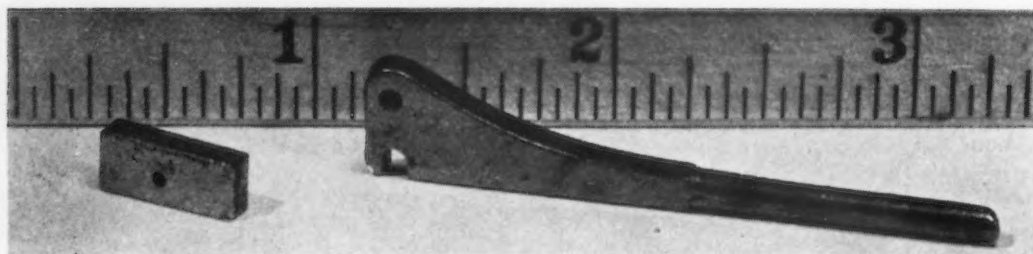
job is done in one stroke of the press.



ASSEMBLY of sleeves in punch holder and stripper plate. The lower sleeve has a light press fit to prevent it from falling out of the stripper.



SAMPLES of work pierced with Durable punches. The hole in the piece at the left is less than one-third the stock thickness, while that at the right is slightly less than the thickness. Bores are straight and smooth.

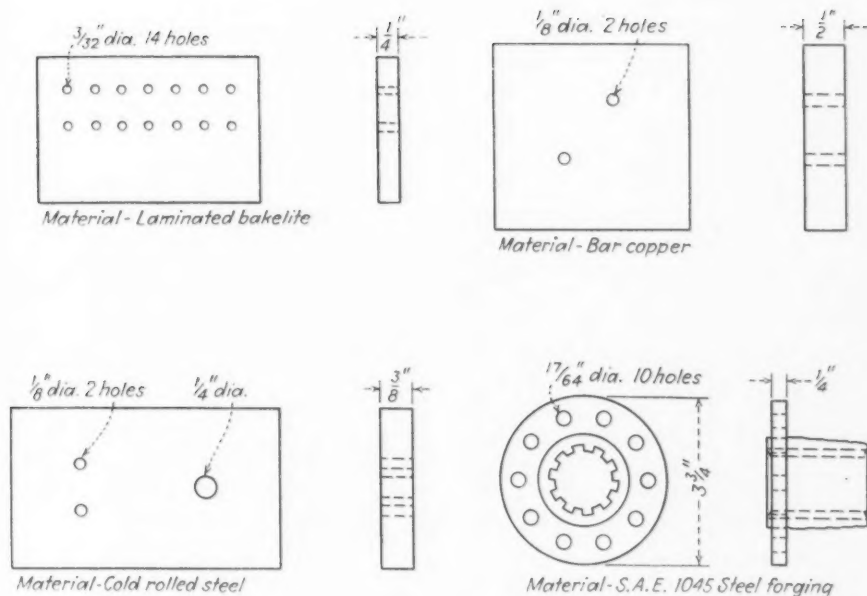


TWO sleeves with interlocking and overlapping prongs accurately guide the punch during the work stroke and prevent it from buckling.

o o o

in Heavy Stock

By J. MALVERN BENJAMIN



OTHER examples of work done by piercing with Durable punches.

The achievement of straight walls and uniform hole diameter in thick material is attained through the use of a pair of interlocking sleeves that guide the punch and support it throughout its stroke. This design permits about half the clearance ordinarily used between punch and die hole and this is what explains the precise results obtained. Despite the small clearance, the punch never touches the die, but comes down concentrically with the hole. It is this action which adds to the life of the punch and gives it its name. In fact, the punch will produce many thousand more holes before regrinding than will an ordinary punch.

As the drawings show, the two sleeves intermesh and support the

punch throughout its entire length, except that portion extending beyond the stripper plate when the punch is going through the work. On each sleeve, three segments of 60 deg. are removed, leaving three prongs of like arc. When assembled, the sleeves cover the entire circumference of the punch including the center portion most likely to buckle under pressure. We all know that a needle supported in a cork can be driven through a coin because the cork supports the needle against buckling; this anti-buckling support is what is accomplished with the intermeshing sleeve. In manufacture, the sleeves are reamed nearly to size, are then hardened and finally lapped or ground to finish size.

Both stripper plate and punch pad are counterbored for the heads of the sleeves. The lower one is pressed into the stripper plate with a light press fit. Too tight a press fit in the stripper will tend to close the hole which would then be required to be relapped. The upper sleeve need have only a snug fit in the punch pad, which should be thick enough to hold the sleeve in alignment.

The punch is a plain rod, uniform in diameter except for a slightly larger head at one end of stripping grip. It is made of carbon steel, high speed or high chrome, high carbon steel, according to requirements. Behind the cutting edges, the punches are lapped to a superfinish in a vertical direction to make stripping easier and put less stress on the punch.

With an ordinary punch there is some deviation from the true vertical motion in going through the metal. This is evident from the fact that the punch eventually chips the edge of the die hole. Therefore in stripping, there must be some deviation from the true vertical to withdraw. This movement puts extra stress on the punch and eventually causes fracture from fatigue. The prevention of this deflection of the punch is another factor contributing to the long life of these Durable punches.

These punches may be applied to square holes, rectangular or irregular as well as round. They may also be applied to slots that would otherwise have to be sawed.

Inverted Process Drilling

DEEP hole drilling of heavy cylindrical pieces of tough material can be greatly facilitated if the work is placed above the drill and is rotated and fed down instead of turning the drill and feeding it into the work in the conventional way. For inverted process drilling, oil tube drills are employed and coolant under fairly heavy pressure is forced to the drill point, carrying all chips down and out of the hole.

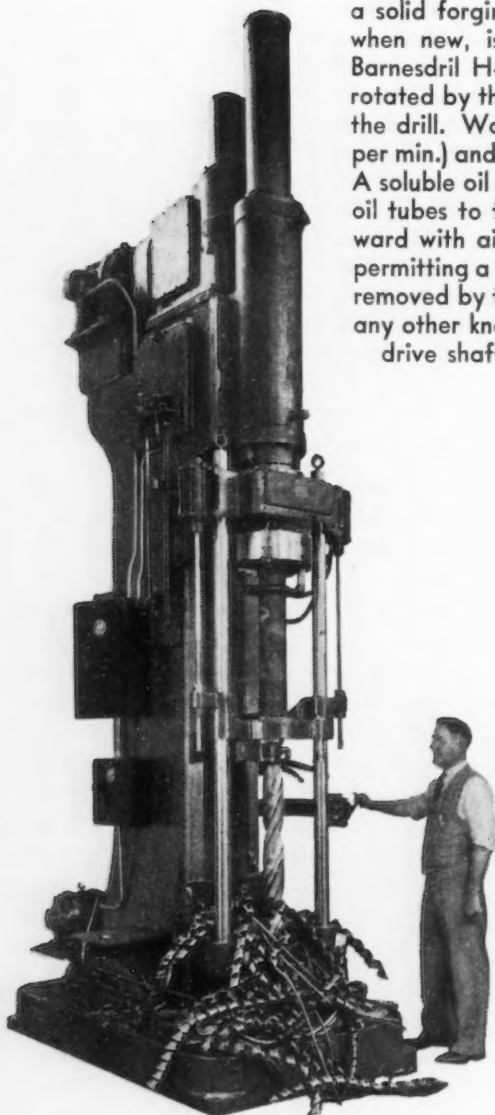
This practice obviates the necessity of step drilling and prevents chips from jamming the drill and deflecting it from its course. Furthermore, for some inexplicable reason, once the work is started over the drill in a straight line for an inch or so, rotation of the work thereafter is sufficient to keep the hole straight all the way through. If the drill is rotated in the ordinary way on the other hand, it will tend to wander and may even come

out of the side of the piece in some instances, particularly where the material is not homogeneous.

The photographs shown are taken from recent installations made by the Barnes Drill Co., Rockford, Ill., chiefly in aircraft engine and parts factories. The Hydram machines which have been especially developed for inverted process drilling are designed to produce extremely heavy thrust loads in line with the drill and work center

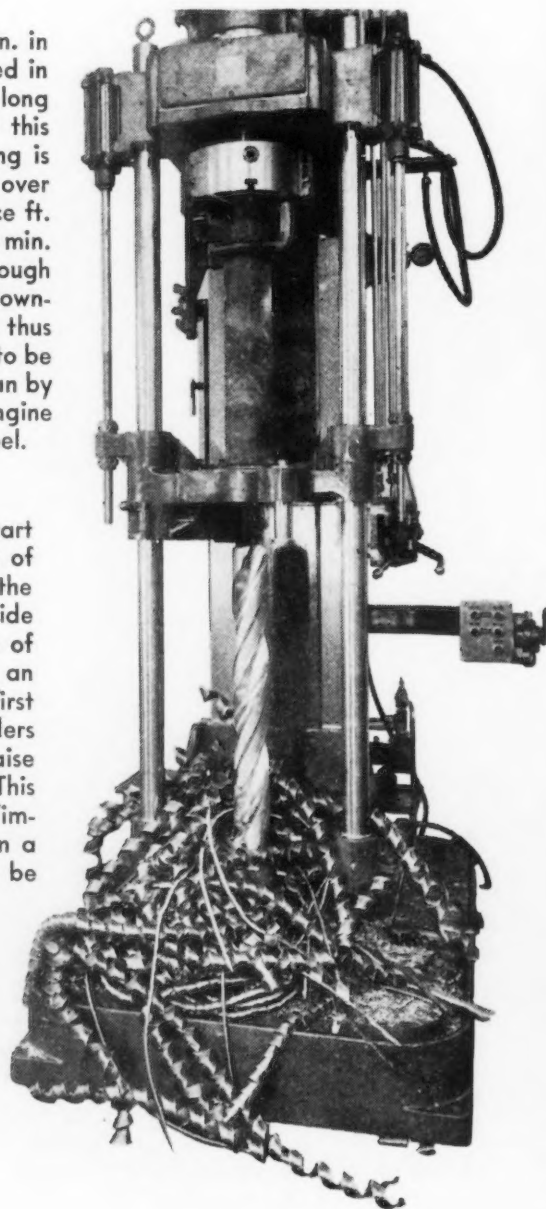
LEFT

INVERTED process drilling of a hole $4\frac{5}{32}$ in. in diameter and 28 in. deep is being performed in a solid forging. The huge drill, which is 36 in. long when new, is held stationary in the base of this Barnesdril H-4 Hydram while the rough forging is rotated by the universal chuck and is fed down over the drill. Work revolves at 45 r.p.m. (50 surface ft. per min.) and feed is 0.013 in. per rev. Time: 25 min. A soluble oil is used as a coolant and is fed through oil tubes to the drill point, forcing the chips downward with aid of gravity and out of the hole, thus permitting a continuous feed. The metal is said to be removed by this process several times faster than by any other known method. Part is an aircraft engine drive shaft and material is a tough alloy steel.



RIGHT

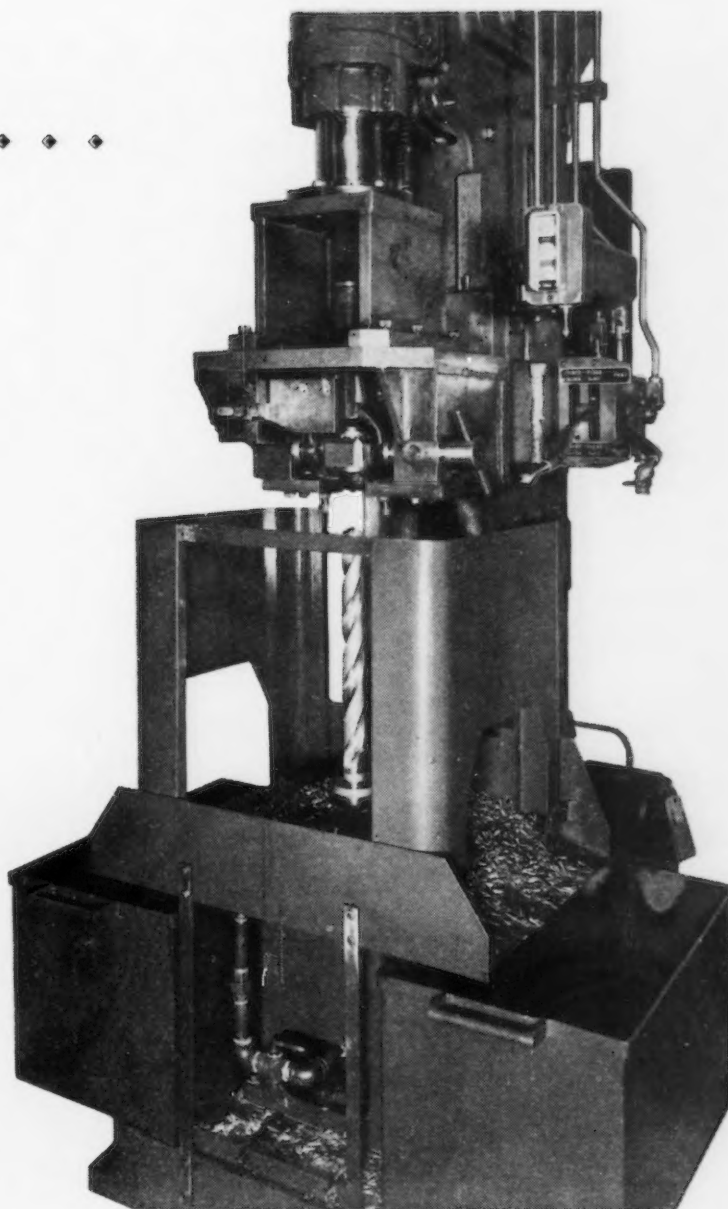
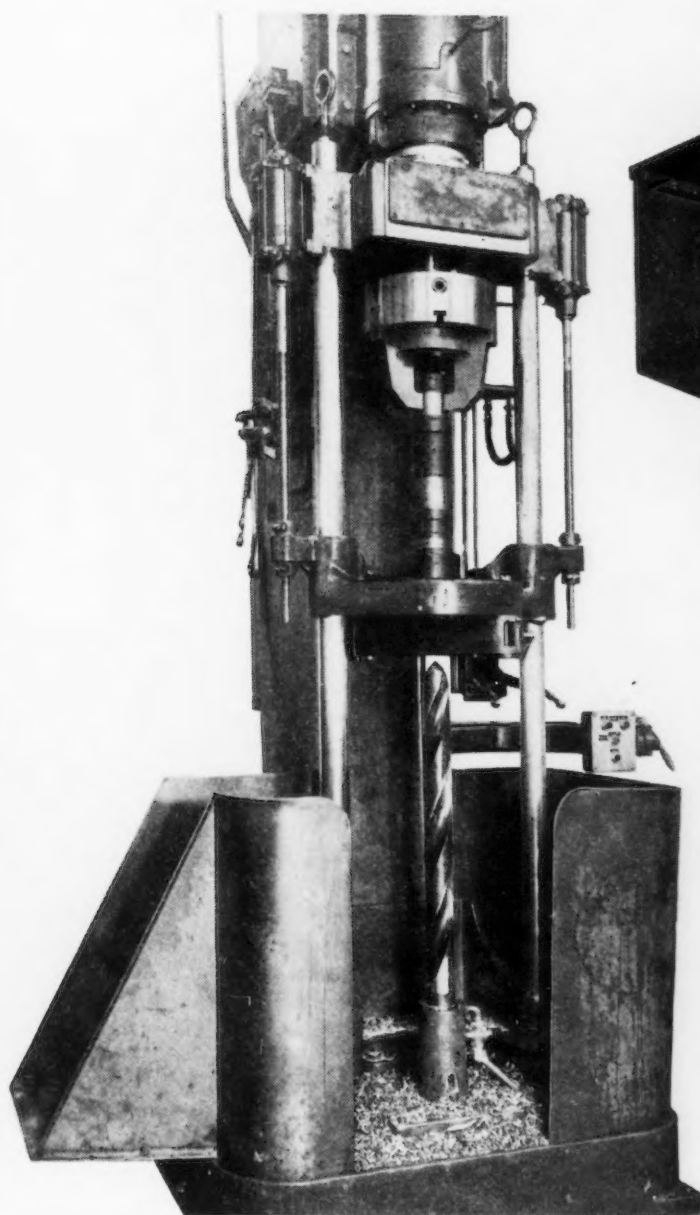
TO centralize the work at start and also to simplify the job of loading the 200 lb. blank in the chuck, a revolving taper guide bushing is used at the bottom of the work. Work is handled by an air hoist and tongs and is first dropped into the cup. Air cylinders on the side of the head then raise the work into the chuck jaws. This guide bushing is carried on a Timken bearing and is mounted on a hinged bracket so that it can be swung out of the way after the drill has entered the work for an inch or so. Removal of the guide bushing (which is first lowered from the work) prevents scoring of the twist drill bushing from chips.



For Heavy Work . . .

BELOW

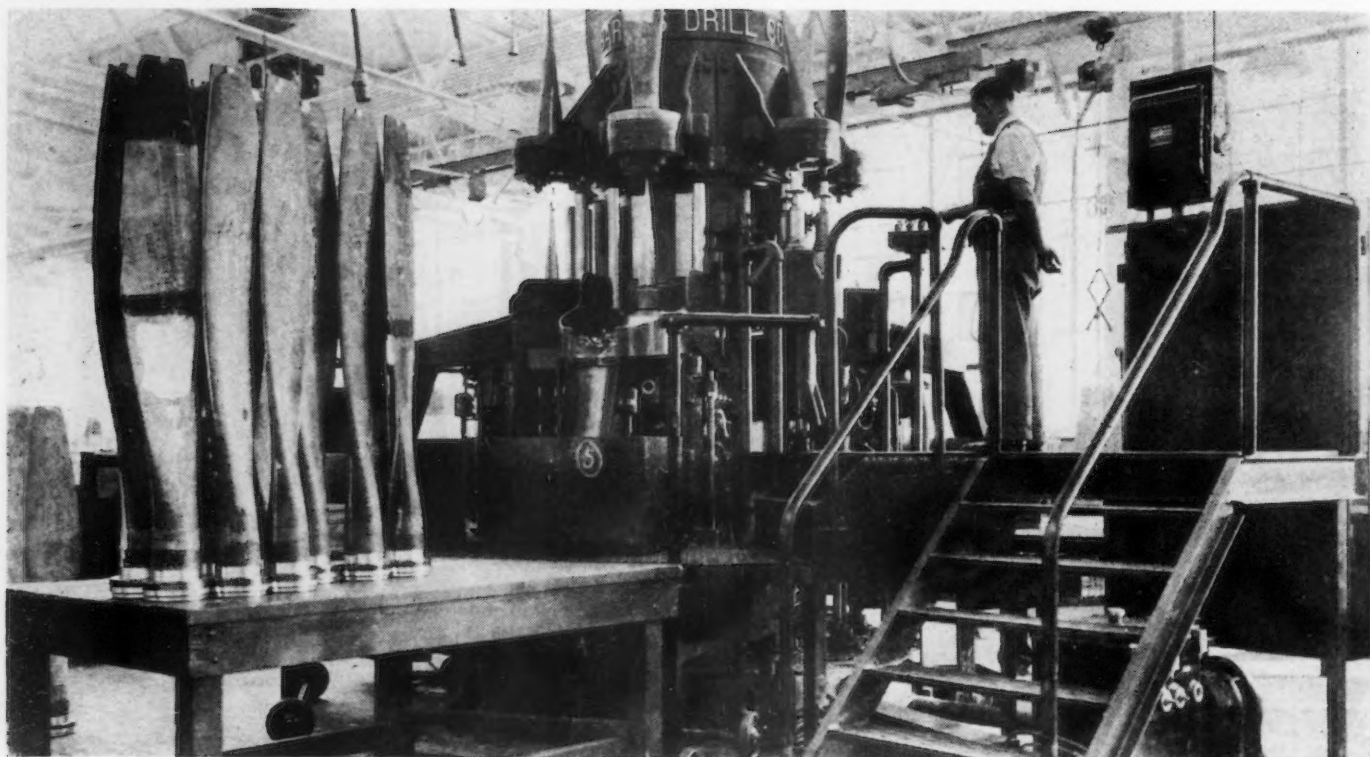
A SOMEWHAT more versatile machine for inverted drilling of an aircraft propeller shaft. The H-4 Hydram special inverted drilling machine is arranged with eight quick change speeds and necessary equipment for drilling $2\frac{3}{8}$ and $3\frac{1}{8}$ in. diameter holes (and other future sizes) in steel aircraft engine parts. Chuck and spindle have a travel of 36 in.



ABOVE

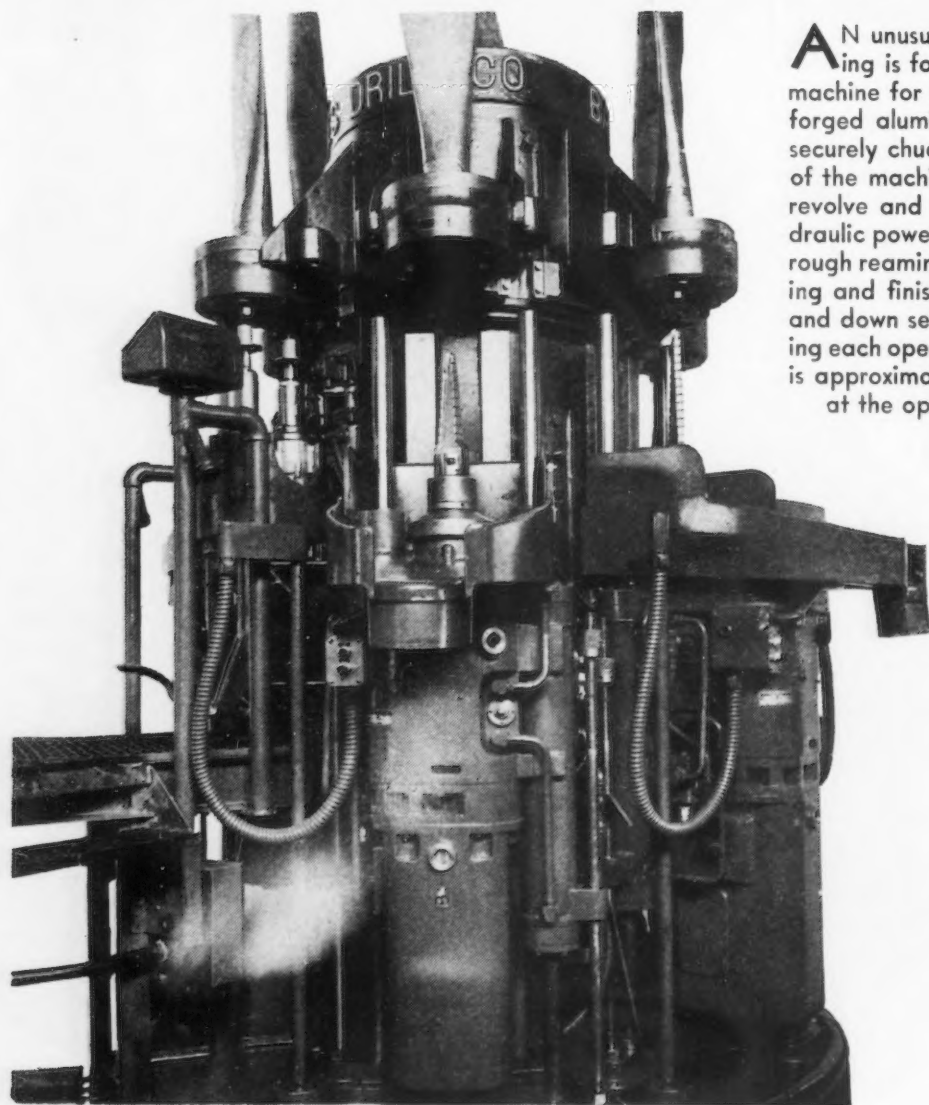
A MODIFICATION of inverted process drilling is shown in this set-up for drilling a hole $1\frac{23}{32}$ in. in diameter in the shank of a universal joint yoke, a distance of about 8 in. On this machine, the twist drill revolves, being driven through a mechanism in the base and taking off power from the vertical shaft that ordinarily drives the work spindle. Here, however, the ram does not revolve but merely feeds vertically. Work is held in a special welded steel fixture located on the bottom of the ram in a permanent position. Since the drill revolves and not the work, the drill is guided by a bushing during the entire operation of drilling. Coolant is fed through the oil tube drill at a fairly high pressure, forcing the chips downward. It is possible to drill the entire length without relieving the twist drill.

o o o



ABOVE

AN unusual application of inverted process drilling is found in this six-station rotary head type machine for drilling and reaming a tapered hole in forged aluminum propeller blades. The blades are securely chucked in the rotating section at the top of the machine. The tools at the five work stations revolve and are fed upward independently by hydraulic power. The first three working stations do the rough reaming and tip drilling, but in the semi-finishing and finish reaming stations, the heads feed up and down several times in step drilling manner during each operation. When completed, the taper hole is approximately 18 in. deep and 4 in. in diameter at the open end. Output is 10 blades per hr.



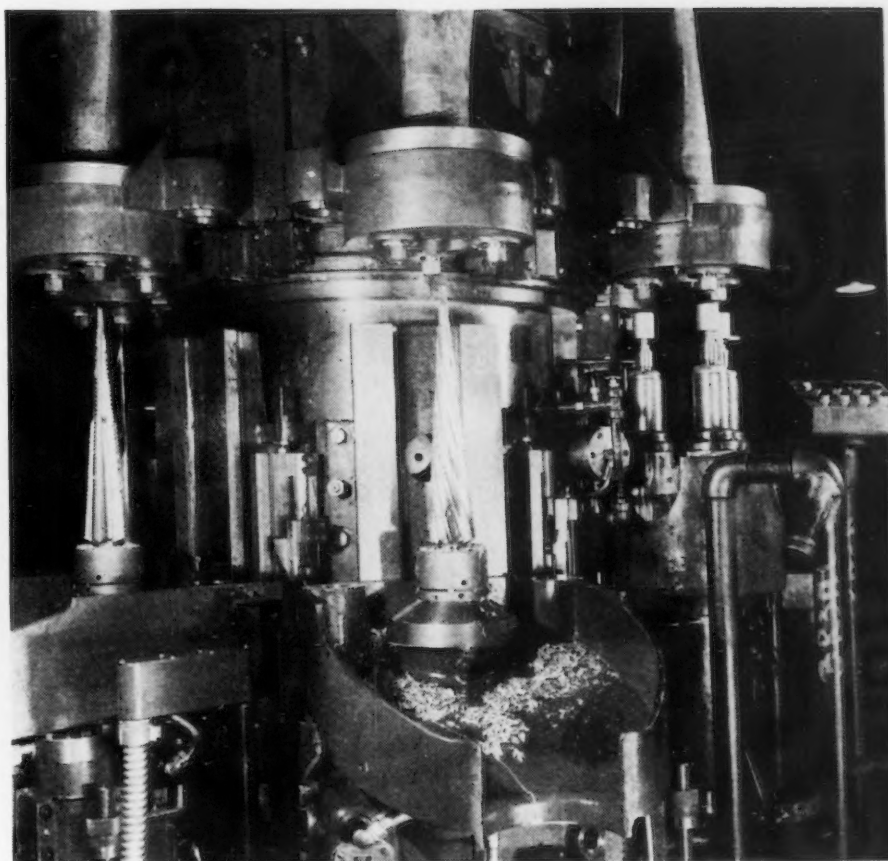
LEFT

FIRST rough reaming station of the six-position center column machine. This particular station feeds the reamer up in one pass at the rate of 1 in. per min. Spindle revolves at 147 r.p.m. and total actual cutting time is 6 min., representing the longest operation and the one that controls final output. This head feeds up to adjustable stops on strain rods located on each side of the unit. When the stops are contacted, the feed momentarily dwells according to a predetermined time cycle control. While this operation is being performed, the other four stations complete their operations simultaneously and operator reloads spare station.

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CLOSE-UP view of the finish reaming station on the six-station machine. This unit, like that for semi-finish reaming to the left reams to a predetermined depth, withdraws and repeats the cycle a number of times before the final depth is reached. This tool also dwells and the length of time of dwell is electrically controlled. Feed per min. is $\frac{3}{4}$ in., spindle speed, 75 r.p.m., time of cutting is 4.69 min. In the semi-finish ream station, spindle speed is 110 r.p.m., feed 13/16 per min. and cutting time 3.16 min. To the right may be seen the loading and unloading station with electrically driven triple nut running device for clamping and unclamping the propeller blades. The nut running unit is actuated by a foot treadle and employs a frictional drive to maintain uniform tension on the nuts.

○ ○ ○



by means of a large hydraulically actuated ram which carries the work chuck. Drive of the short, stocky spindle is by a large gear on the nose of the ram, the gear being driven by a pinion on the end of a six-splined vertical

splined shaft from the gear box at the top of the machine.

Modifications of the inverted drilling process include installations where the drill is driven invertedly for relatively short work held in a fixture and fed down by

a hydraulic ram, and also a special multiple station, rotary head machine where the tools (drills and reamers in this instance) are both revolved and advanced upward into the stationary held workpieces.

“Porous Chrome Hardening” for Engine Parts

THE Van der Horst Corp. of America, recently organized by Hendrik van der Horst to introduce in America his patented process of “porous chrome hardening,” for cylinder walls, piston rings, bearings, etc., has announced the establishment of its headquarters at Olean, N. Y., where a new plant has been constructed and is in full operation, after three months of experimental work.

Mr. Van der Horst began experiments on his present process in 1932, at Hilversum, Holland, where his original plant is in operation. Later he also established British Van der Horst, Ltd., with works at Sheepbridge, Chesterfield, England, and the new plant at Olean is the

third to engage in application of his process.

The theory of Ricardo, the British Diesel expert, that cylinder wear is mainly caused by corrosion rather than friction, and the great resistance of chromium to corrosion, led Mr. Van der Horst to begin his first experiments in chromium plating of engine cylinders. It is said that many difficulties were encountered, including the problem of developing a coating sufficiently porous in texture to hold lubricating oil, but after several years his efforts were rewarded. In Europe his process is today in wide and growing use for Diesel, gasoline and steam engine cylinders of all types and sizes; for compressor,

pump and pneumatic tool cylinders; and for protecting other surfaces subject to wear or corrosion, including crankshaft bearings, piston rods, pins, crosshead guides, etc.

In England such manufacturers of Diesel engines as R. A. Lister, Ltd., of Gloucestershire, and W. H. Dorman & Co., Ltd., of Stafford, are licensees of the process and chrome-harden the cylinders of their entire output of Diesel engines. In the United States two important chrome hardening plants are already being operated under Van der Horst licenses, those of the American Hammered Piston Ring Division of the Koppers Co., at Baltimore, and the Naval Aircraft plant, at Philadelphia.

Means and Paradiso Answer Critic is

February 5, 1941.

Mr. J. H. Van Deventer,
Editor, *The Iron Age*,
100 East 42nd Street,
New York, New York.

Dear Sir:

We greatly appreciate your invitation to be heard in your journal on the subject of new steel capacity. As Mr. Lippert has indicated in his article on Jan. 23, it is a matter of the greatest concern to the steel industry and to the nation. We are all agreed that it is imperative for the industry to produce all the steel required for the implements of national defense. The present controversy on steel capacity, therefore, revolves around the problem of whether the industry has sufficient capacity to meet civilian steel requirements.

Before an answer can be given to this problem it is first necessary to determine what the military and civilian requirements are likely to be. While fairly accurate estimates of steel required for military purposes, both internal and export, can be ascertained from the government's program, to estimate civilian demand for steel with a fair degree of accuracy is a much more difficult problem. One way of making such an estimate is to first estimate on the basis of past experience what civilian requirements for steel might be expected to be if times were normal and then adjust these estimates to present day emergency conditions.

¹ In the 1926 Annual Report of the American Iron and Steel Institute the steel ingot capacity (excluding castings) as ascertained by the Committee on Special Survey of Capacity was given as of the end of 1925 in two forms, i.e., theoretical capacity 56 million gross tons and practical capacity, which allows for necessary shutdowns, 50 million gross tons. In the 1931 Report of the Institute annual steel ingots capacity is given each year from 1920-1931. In this series the figure given as of the end of 1925 is 55.8 million gross tons, or approximately what was ascertained as theoretical capacity by the Committee in 1926. For the following years the capacities are: end of 1926, 58.0; 1927, 59.4; 1928, 61.8; 1929, 63.1; 1930, 66.9; and 1931, 68.3. In none of these years is there indication that the capacity was reported on a practical basis. The same series is continued in the subsequent annual reports of the Institute and in no year has the Institute revised its figures to indicate that it reported practical rather than theoretical capacity. In view of the importance of the capacity data at the present time there is need of a further clarification of the character of the capacity series over the years beyond that given by Mr. Lippert.

After the total military and civilian steel requirements have been estimated it would then be possible to determine whether the present capacity of the industry, as reported by the American Iron and Steel Institute, is sufficient to take care of them. If present capacity is inadequate, then the question of whether the industry should build new plants or not is a policy question which can be determined only by the proper responsible persons in the industry and government. Only if such steps are carried out can effective policy be made.

Our report, "Capital Requirements—A Study in Methods as Applied to the Iron and Steel Industry," presents methods which were used to estimate steel requirements under normal peacetime conditions for different assumed levels of economic activity. This study has been criticized by Mr. Lippert as to the assumptions, results and its alleged conclusions. We wish to thank Mr. Lippert for the technical criticisms offered. However, he has so seriously misconceived and misinterpreted the purpose and scope of the steel report, that we take this opportunity both to reemphasize the purpose of the study and to examine the validity of his criticisms.

Purpose of the Study:

Our report was primarily a study in methods. Its object was to develop a method adaptable to any industry for estimating new capacity which would be required at different assumed levels of national income under peacetime conditions. The study did not present forecasts for 1941; it did not attempt to state what the steel requirements would be in a year when the United States was engaged in a defense program; it did not recommend or even suggest to the steel industry what new capacity it needed to install in this year or in any other year. The concrete figures were primarily presented to exemplify the method.

Historically, the study was completed in its essentials by the end of 1938. It was subsequently revised only in detail as a result of criticisms by technicians and others, including certain leading executives in the steel industry. The publica-

tion of the report in the middle of the present capacity controversy was the fortuitous result of the delay caused by the pressure of other work. It was sent to the overworked government printing office in April, 1940 and made public as soon as it came back in November. We believe that Mr. Lippert has inadvertently misled the readers as to the report's significance by referring to it as the "Big Bertha" of a government program to induce an expansion in steel capacity.

The report itself is based on certain clearly stated assumptions and its results are only directly applicable to economic activity carried on under these assumed conditions. The assumptions most fundamental to the study are that *there is no fundamental change in the present relations among business, labor, consumers and government, and that consumers and investors can spend their incomes and dispose of their savings with the same freedom which they have enjoyed in the past.* It must be apparent to anyone who takes the trouble to understand the purpose, scope and method of the steel study that the results obtained are valid only under the assumption that our American way of life continues.

We believe that the real value of the study lies in setting forth methods which can be adapted to meet the special conditions of the present period or adapted to meet other possible conditions which might arise in the future. Because the estimates developed in the report in exemplifying the method are based on the assumption of peacetime condition, a very considerable modification in them would be necessary before they would become applicable to the present situation. These estimates do have some value in suggesting the very considerable amount of steel demand which is likely to arise under normal conditions when national economic activity reaches higher levels than those heretofore experienced. However, it is repeatedly pointed out in the report that even for peacetime conditions, the estimates are to be considered only as first approximations and could be greatly improved by

isms of Their Steel Capacity Study

engineering and technical analysis on the part of the industry.

Mr. Lippert's Criticisms:

Mr. Lippert's detailed criticisms of the report turn largely on technical matters. He says that one of the "two serious errors which largely invalidate the conclusions of the report" is an over-estimate "of the net retirements per year of existing equipment." As a matter of fact we made no estimate of *net* retirements but only one of *gross* retirements. Naturally his estimate of net retirements differs from our estimate of gross retirements, but no error in our final figures results from this difference. Rather these figures purport to be estimates *as of 1938* of the new plant construction which would be necessary in 1939 and 1940 if different hypothetical levels of steel requirements were to be met in 1941 rather than estimates of new capacity likely to be required in 1941 as Mr. Lippert implies.

On the second of the "two serious errors" Mr. Lippert gives us comfort by himself adopting our position. In our report we discount the rated capacities of open hearth furnaces by deducting approximately 10 per cent to allow for an assumed difference between the rated capacities as published by the American Iron and Steel Institute and practical capacities. Mr. Lippert asserts that this is an "entirely fallacious assumption" and revises our figures on the assumption that rated capacity is also practical capacity. But on page 87 when he makes his own estimate of capacity he says that "it was not believed possible to maintain an ingot-operating rate over a protracted period of more than 90 per cent, due to the necessity of making furnace repairs, etc." He then proceeds to deduct 10 per cent from rated capacity to get the practical capacity just as we did.

This confusion in the interpretation of the character of the existing capacity data emphasizes the need for a clarification of the series published by the American Iron and Steel Institute.

In 1926 the Institute reported that the practical capacity for steel,

Ed. Note: The status of the steel industry as regards need for new capacity was examined in the Jan. 23 issue. Therein considerable criticism was leveled at a report on the same subject by Gardiner C. Means and Louis J. Paradiso. The following letter constitutes a Means-Paradiso rebuttal. Again, it must be emphasized that THE IRON AGE article said of the Means-Paradiso report, "its purpose has been misinterpreted and its tentative and purely hypothetical conclusions blindly accepted . . .". Certain weaknesses of a forecast of 1942 consumption are pointed out herein—but the article itself pretty well acknowledged these weaknesses. It was believed that action to tone down the present splurge of overstocking, and the likelihood of the industry maintaining an operating rate of over 90 per cent, would more than offset possible underrating of consumption in certain industry groups.

after allowance for "lost time," was about 10 per cent below the theoretical capacity. In its annual reports the Institute presents the theoretical capacity figure in 1925 and a progressively increasing series in subsequent years.¹ If the currently reported figure of the Institute actually represents practical capacity and yet is part of a continuous series which represented theoretical capacity in 1925, and this latter seems to be the case, the reasons for the present confusion would be clear. Since the industry has been operating at over 95 per cent of reported capacity for the past three months, it is evident that practical capacity is more than 90 per cent of rated capacity. At the same time it is by no means clear that an average of 100 per cent of rated capacity can be obtained for a period of a full year.

For the other items in which Mr. Lippert suggests error, we can agree with him on some and question others. As he points out, the coke requirement figures would need to be increased for peace conditions by the amount necessary for ferro-alloy furnaces, a clear error of omission on our part. Also, any

peacetime increases in coking capacity would presumably take the form of by-product ovens rather than being divided between by-product and bee-hive ovens as we indicated. The reconditioning of bee-hive ovens now going on is presumably a product of the emergency and therefore not in conflict with Mr. Lippert's view. On the supply of scrap, quite a wide variety of opinions are possible. The data in this field are far from satisfactory and much more work is needed before satisfactory estimates can be reached. This problem was not covered adequately in our report. On the cost of new rolling mills, we used figures supplied by a steel executive, adopting the most conservative estimate, but we indicate that the cost figures are of a most superficial character. Since Mr. Lippert does not indicate the basis by which he arrives at his "revised estimates of cost," it is not possible to comment on them. Such calculations become significant only after agreement has been reached on the amount of new capacity required.

On one quite important matter Mr. Lippert has inadvertently given your readers a false impression. After indicating the three different assumed levels of national income in 1941 for which peacetime steel requirement estimates were made in the report, he says "there is the further assumption that these levels will be maintained over sustained periods of time." Actually the reverse is the case. All the data on which the report is based applies to a period of wide swings in business activity. Therefore the extrapolation of the past relations into the future carry the implication of such fluctuations. Certainly future stability is not one of them. However desirable it would be to reduce the "prince and pauper" swings in steel, no such assumption of greater stability underlies the figures in the report. His misunderstanding of this point, leads him to criticize the procedure used in estimating steel requirements in a fluctuating economy on the ground that it does not produce estimates of steel requirements in a stable economy. Of course, if an effort were to be made to estimate steel requirements at a

high and stable level of national income, adjustments would have to be made for the elimination of the "prince and pauper" swings in steel and for the stability of inventory. But as long as we have a fluctuating economy the immediately applicable techniques of analysis must be geared to that fact.

Criticism of Pattern Technique:

With respect to the general technique employed, Mr. Lippert suggests that the same technique, used in the earlier publication, "Patterns of Resource Use," lead to "fantastic results." Because we believe that the techniques we have employed in both of these reports can be of very considerable use to the steel industry and will be, in fact, are being, used by the most progressive units of the industry, we think it worth pointing out that what Mr. Lippert calls "fantastic results," are, on the contrary, very good common sense. Mr. Lippert suggests that it is fantastic to have huge percentage increases in durable goods demand when national income increases from 50 billion to 100 billion dollars and very much smaller percentage increases in the demand for non-durable goods. But the one thing generally agreed on by students of business fluctuations is that the fluctuations are very much greater in the durable than in the non-durable industries. Steel, copper, automobiles, and construction are "prince and pauper" industries while medical service, domestic help, education and food are much more stable. If the people of this country had the buying power represented by a 100 billion dollar national income, they certainly "would cover these 48 states with houses and articles made of iron, copper, lead and zinc"—new automobiles, electric refrigerators, radios and a host of things that people buy only when their income is higher than usual. The conclusion suggested in our report that if national income increased from 50 to 100 billion dollars, steel requirements would increase 242 per cent and copper 429 per cent, does not seem fantastic when we remember that from the low point in the depression to 1940 steel production increased 337 per cent and copper increased 212 per cent, while the national income increased only 84 per cent. In contrast the 84 per cent increase in national income was associated with only a 39 per cent increase in

cheese consumption, a 27 per cent increase in the service of retail trade, 22 per cent increase in financial and other service and only 9 per cent in butter industries. These actual facts at first sight may look fantastic but they are not unreasonable when the difference in the durability of the items is considered.

Mr. Lippert's Forecasts:

Following his criticisms of the steel report, Mr. Lippert turns to forecasting steel requirements for 1941 and 1942, for the purpose of "laying the ghost of steel shortage." The following table compiled from the article gives a comparison of the actual 1940 consumption of hot rolled steel products with his forecasts made for 1942.

On the basis of these forecasts and existing steel capacity, Mr. Lippert concludes, as follows: "After the reader has waded through all these figures, it should be obvious that this question of steel capacity need cause no concern. There will be sufficient steel available in 1942 to meet all demands of peace and wartime industries and likely a little to spare." (Italics ours). We are not in a position to review the forecasts made by THE IRON AGE since the assumptions upon which they are based are not stated in the article. However, we would like to make certain observations.

Mr. Lippert's figures show only a 5 million net tons increase in steel for defense and export in 1942 over 1940; 1.4 million net tons increase in steel used in shipbuilding, railroads, and industrial machinery and tools, all closely associated

with defense activity; and an actual decline in the sum of other civilian steel demands. In sum his figures show an increase in total steel demand of about 13 per cent. When it is considered (1) that the defense program was hardly under way much before the last quarter of 1940, (2) that two-thirds of steel exports were in the last half of 1940, and (3) that under the impact of the defense and export programs, total business activity in 1942 is likely to be very much higher than in 1940, this 13 per cent looks very small. It actually implies a rate of steel consumption (including export) lower in 1942 than in the last quarter of 1940. Yet other economic activity can be expected to be very much higher.

In summary, the criticisms which Mr. Lippert makes of our steel study do not in any sense invalidate the techniques developed, nor the main results and conclusions reached with respect to peacetime steel requirements in a fluctuation economy. The results and conclusions, however, must be interpreted in the light of the assumptions explicitly made and the limitations inherent in the data and techniques used. We believe that the methods developed, when properly adapted, might prove fruitful in throwing light on the steel requirements in the present situation and other possible situations which might develop in the future. Again we thank you for this opportunity to make our position clear.

Very truly yours,
Gardiner C. Means,
Box 43, Vienna, Va.
Louis J. Paradiso,
Washington, D. C.

Consumption of Hot Rolled Steel Products—Actual 1940 Compared with THE IRON AGE Forecasts for 1942

(In thousands of net tons)

	Actual 1940	Estimated 1942	Change 1940 to 1942
Consuming Industry			
Automotive	7,000	6,000	-1,000
Oil, gas, water and mining	2,800	2,500	-300
Construction	7,000	6,800	-200
Containers, light	2,900	2,800	-100
Household equipment and appliances	1,800	1,800	0
Agriculture	1,000	1,100	+100
Industrial machinery and tools	2,150	2,500	+350
Shipbuilding	1,000	1,500	+500
Railroads	3,450	4,000	+550
Miscellaneous and all others	6,800	8,000	+1,200
Total domestic	35,900	37,000	+1,100
Export (based on 1940 experience)	10,000	7,000	+5,000
Defense program needs		8,000	
Grand total	45,900	52,000	+6,100

New Equipment . . .

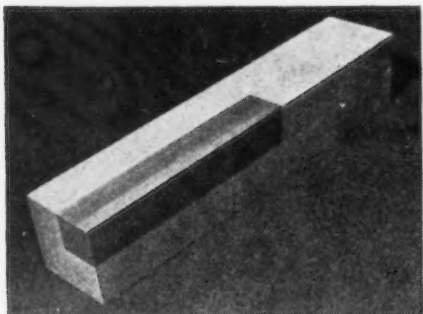
Small Tools and Gages

In this review are described some new developments in the line of tool steels, of cutters, saw blades, tool grinders, gage blocks, snap gages and other apparatus in this sphere.

THOROUGH and extensive tests on production jobs are stated to have proved the new Haynes Stellite Star J-Metal tools to be a substantial improvement over the former grade. This latest cobalt-chromium-tungsten cutting alloy is recommended under identical treatment for all machining operations now being performed with the original Stellite J-Metal tools. Tool life between grinds is substantially improved and makes possible in some cases higher cutting feeds and speeds. Because of these features *Haynes Stellite Co.*, Kokomo, Ind., has substituted the new alloy for the old grade. It is available in all of its manufacturer's standard tool bit sizes, both squares and flats, and in many standard and special blade designs and sizes; also in the form of standard welded tip tools and in many special tools designs.

Tungsten-Tantalum-Carbide Tool

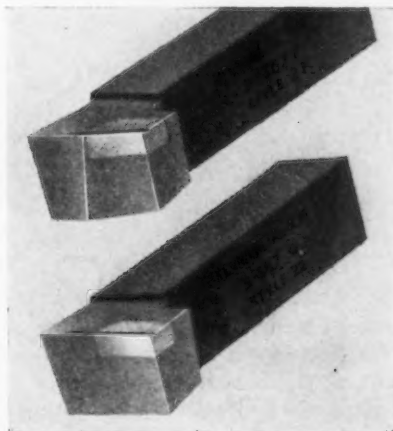
A GENERAL purpose grade of hard cutting alloy Tantung G, has been developed by *Fansteel Metallurgical Corp.*, North Chicago. These tools are recommended for higher cutting speeds than those attainable with high speed steel or where machines cannot use cemented carbide tools. Tantung G



is composed of tungsten and tantalum carbide in a matrix of cobalt and chromium and is obtainable in tool bits for use in tool holder and also in the form of Economy tools. Tantung G Economy tools are furnished ground with a 7 deg. angle across the face, so that the tool holding a bit of the cutting alloy in one corner, can be used both for right or left-hand cutting.

New Facing Tools

NEW styles of facing tools have just been added to the standard line of Kennametal tools of *McKenna Metals Co.*, Latrobe, Pa. These No. 21 and 22 tools have 6 deg. side and front clearance angles, 8 deg. end cutting edge an-

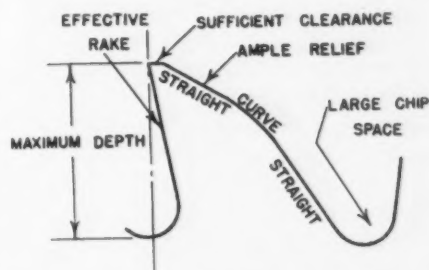


gles, 6 deg. side rake and 2 deg. negative back rake. Style 21 should be used where a 90 deg. shoulder is not required, as it has a 20 deg. side cutting edge angle. Style 22 should be used with a 90 deg. shoulder. The negative back rake is characteristic for Kennametal tools and has the effect of imparting greater strength to the carbide tip. Both tools are equipped with

chip breakers, No. 21 with a groove type parallel to the cutting edge and No. 22 with a shelf type ground 5 deg. from side cutting edge.

Improved Milling Cutters

CLAIMED to be the result of extensive research and experiments the new Paraform milling cutters, produced by *Barber-Col-*



man Co., Rockford, Ill., are stated to feature a substantial advance in tooth design. A combination of maximum chip space and strength is claimed by designing a straight relief back of the land, the rake on the face of the tool being planned for best cutting qualities and the curve at the root of the chip space of such a radius as to prevent jamming of the chips between the teeth, permitting them to curl and flow out freely. As the cutter is sharpened, its tooth form can be maintained throughout its entire length.

Complete Tool Sets

RECENTLY the *George Scherr Co., Inc.*, 128 Lafayette Street, New York, announced that it had brought out its own line of GS machinists tools. The line consists of combination sets with drop forged hardened square heads, hardened

center head, hardened blade and reversible protractor head; a machinists' combination set with hardened blade and center head, protractor and square head of cast iron, 4, 6 and 8 in. dividers and inside and outside spring calipers, hardened and tempered center gages, thickness, depth and surface gages, and magnifiers. Hook sliding calipers, flexible and narrow tempered rules are also included in this line.

Double Edged Hack Saw Blade

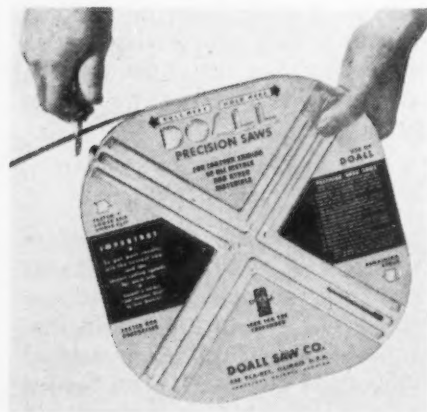
FOR a new development of a two-edged hack saw blade, the *Millers Falls Co.*, Greenfield, Mass., claim considerable savings of money and material. Teeth along



the first cutting edge are set fractionally wider than along the second, eliminating drag and wear. A special heat treatment which leaves teeth hard, ends and center soft, makes the blade shatterproof and unbreakable. Thus the two problems which stood in the way of production have been overcome, namely the dragging of the top blade in the slot and the destruction of the blade through breakage. *Millers Falls* reports exhaustive tests revealing that each side delivers full performance even on positive feed machines, cutting twice the usual maximum depth at each stroke. Production time is thus considerably reduced.

New Band Saw Container

METAL box containers for packaging narrow band saws of 100 ft. length is designed by



DoAll Co., 1201 Thacker Street, Des Plaines, Ill. This is much more rigid and durable than the former cardboard box. The saw can be pulled out in the same manner as a tape measure. When the desired length is pulled out, it is snapped off, ready to be welded into a band. Boxes may be stacked on a shelf. A window shows how much material is available and an outside label gives specifications of the saw. Color of label indicates whether the saw tape contained is of the raker, wave or straight type.

All Purpose Grinder

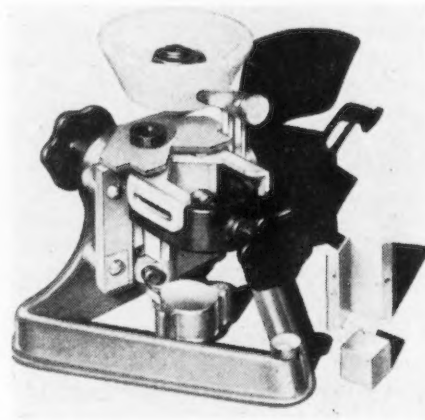
GRINDING and lapping equipment, All-In-One, has been developed by the *T. C. M. Mfg. Co.*, Harrison, N. J., for the maintenance of cutting tools of all types. Bench or floor models permit five types of head assemblies with alternative wheel and lap equipments. Accessories permit special operations other than grinding or lapping. There is a groove grinding



device for forming chip control grooves in cemented carbide tips, a production type protractor with micrometric feed for accurate duplication of tool profiles, a tip cutting attachment for resizing and salvaging carbide tips and a drill grinding attachment with a capacity for twist drills from 1/4 to 1 1/4-in. diameter. The motor, equipped with preloaded ball bearings, operates at 1750 r.p.m. and can be geared down for slow grinding speeds. A simple brazing fixture makes it possible for users to braze tips on lathe tools, reamers, milling cutters and similar articles.

New Grinding Fixture

ROAN MFG. CO., Racine, Wis., has announced a new end mill grinding fixture. This compact device will, the manufacturer asserts, grind an end mill in 5 min. The grinding wheel slips into the chuck of any high speed drill press, converting it into a tool grinder at



small cost. It grinds mills up to 1-in. shank diameter and is equipped with a precision-made shank arbor which fits a 3/8-in. capacity drill press chuck. It will hold end mills of any size up to a Brown & Sharpe No. 9, and it also grinds hollow mills, counterbores and other facing tools of practically all needed sizes. The movable V-block of the fixture is adjusted by a fine-threaded thumb screw and there is a leveling screw for grinding straight faces on an end mill. A grinding wheel for high speed steel is also supplied.

Air Grinder

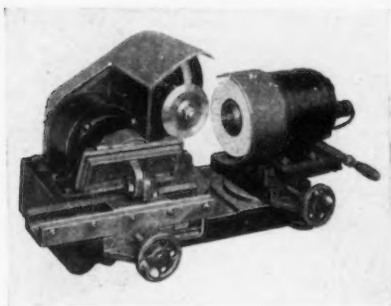
BABY air grinder was added by the *Ingersoll-Rand Co.*, Phillipsburg, N. J., to its line of pneumatic tools. This size 00 tool operates at 20,000 r.p.m. at 90 lb. pressure and weighs 1 1/4 lb. It is built to take 1 1/2-in. diameter organic bonded and 1 1/4-in. diameter vitrified wheels. Also available are various sizes of collets to take mandrel mounted grinding wheels or



small twist drills. Although originally designed for die grinding, it now finds a wider application in industry for light grinding jobs in places that are ordinarily hard to reach.

Bench Grinder

A NEW compact, bench type utility grinder for circular slitters and straight corner cutters with drill grinding attachment for box plants and other users of small knives has been developed by Samuel C. Rogers & Co., 191-205 Dutton Avenue, Buffalo. It can be



used for any type of slitter knife, single or double bevel or square edge by a double slide and swivel, adjustable for all requirements. The slitter knife and grinding wheel are driven by two motors to give the correct peripheral speed for precision grinding. The slitter knife arbor is rigid and adjustable. A hand lever allows positive cross feed of grinding head to slitter knife. Up to 8-in. cutter knives can be sharpened. A drill grinding attachment is furnished on special order.

Air Drill

FURTHER additions to the Multi-Vane types of air drills are announced by the maker, the Ingersoll-Rand Co. These sizes 00 and 0 are lightweight tools, weighing between 1½ and 2⅞ lb. Attachments make the tool useful for light screw driving, nut running, close quarter drilling, wire-brushing, sanding, etc. Three types of handles, straight, lever throttle or pistol grip are available.

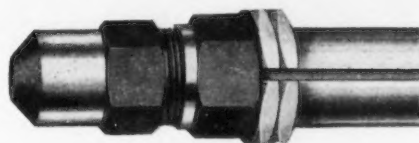


New Tool Steel

MEDIUM carbon manganese-molybdenum steel, called 773 tool steel, has been added to the line of steels of the Jessop Steel Co., 537 Green Street, Washington, Pa. Unusual toughness makes this steel suited for tools, dies, punches, cutting tools, chisels, etc., and for applications where toughness in thin sections is required, as in step down dies, spatulas, scraper knives, putty knives, etc. The outstanding toughness of the material has been brought out very well in practice and it is expected that this quality will gain wide application and popularity for the 773 tool steel.

Set of Collet Chuck Eccentrics

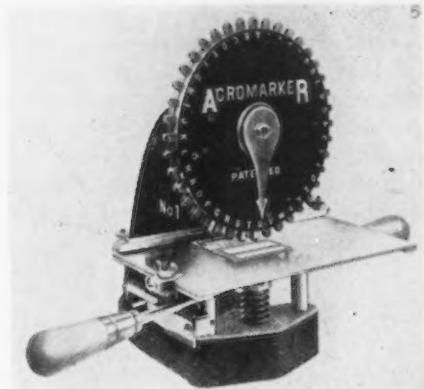
A PRECISION chuck with a multi-purpose set of eccentrics has been developed for automatic screw machines by the Erickson Steel Co., E. 80th and Bessemer, Cleveland. A pair of eccentrics is fitted over the shank and the chuck is ready to fit the automatic. Each hexagon has 0.005 in. eccentricity which makes centering very simple. The Erickson chuck collets are capable of collapsing 1/32 in., maintaining their gripping power and accuracy for shanks from 0.013 to 0.5 in. in a series of 15 collets. Faster feeds



and more accurate drilling is made possible, since twist drills, reamers and other tools may be set to any desired length in the hollow shank of the chuck. An eight point grip assures hold and non-slippage regardless of load, even on the flute of the tool.

Name Plate Stamping Machine

HEAVY duty dies are carried on the new circular Acromark nameplate stamping machine which carries the alphabet, a set of figures and dash, diagonal line, comma and period. The holding fixture receives a nameplate from 0.0001 to ⅝ in. thick and up to 8 x 4¾ in. and permits stamping within a 1-in. frame. The die wheel rotates freely on roller bearings and can be arrested and positioned for each character. At each



stroke of the operating lever the table can be advanced a full space or less. The dies are sufficiently strong to do extensive stamping of alloy steel. This stamping machine also is produced by the Acromark Co.

Sheet Holders

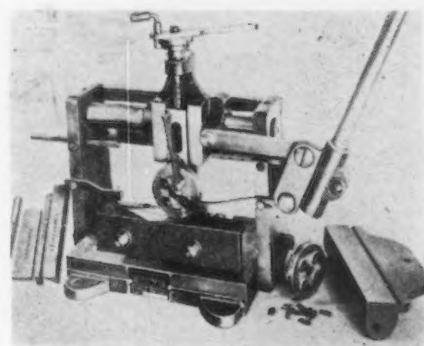
CLECO sheet holders made by the Cleveland Pneumatic Tool Co., 3734 E. 78th Street, Cleveland, are designed to meet the need for holding sheets together tempora-



rily before riveting or welding. They are supplied in a variety of four sizes between sizes from 3/32 to 3/16 in. They are simple and efficient in use and are stated to facilitate greatly the work of joining sheets.

Round and Flat Marking Machine

A NEW marking machine for both round and flat parts, including tapered articles is offered by H. O. Bates (The Acromark Co.), 251-257 N. Broad Street,



Elizabeth, N. J. The marking area is sufficient to take parts up to 10 x 4 in. In the machine, round pieces are rotated as a flat die impresses the mark, whereas flat parts are marked with a roller die. This No. 9 marking machine is adaptable to imprint names, numbers into a variety of shapes and sizes.

Inspection Apparatus

DESIGNED to provide standard conditions of lighting and magnification, the Spectifier of the *Eastern Machine Screw Corp.*, New Haven, Conn., will be useful



both for plant and supervision inspection. It has no focusing device and no holders are required. Parts of up to 3 in. diameter can be examined for finish or surface condition. The lens has been specially selected to provide easy focusing for both eyes.

Vibration Frequency Meter

LIGHTWEIGHT vibration frequency meter is announced by the *Westinghouse Electric & Mfg. Co.*, Radio Division, Baltimore. The



new instrument can indicate frequencies between 500 and 20,000 cycles per min. This compact device consists of a thin spring steel vibrator clamped at one end between a set of steel rollers. A knurled knob connected to the rollers permit their rotation, and moves the steel reed in and out, changing its frequency of vibration. A sliding pointer on the back end of the steel reed indicates the vibrating frequency which is read off a scale. To use the meter, its head is held against the vibrating body and the adjusting knob rotated until the vibrator reed oscillates at maximum amplitude. The meter will indicate a vibration whose double amplitude is 0.0001 in. or greater. It can measure harmonics of basic vibration frequencies. Although not designed to measure the amount of vibration, it may be used as a rough indicator of its magnitude.

Optical Comparator

FOR checking small flat objects the *Jones & Lamson Machine Co.*, Springfield, Vt., has brought



out a new vertical optical comparator. Set in the 8 x 7-in. object staging table, central with the condensing and projection lenses, there is a 3¼-in. diameter glass disk on which objects may be staged for projection. To focus the object, the table is adjusted vertically by a screw at the top of the machine. An 8-in. diameter alumina-coated mirror reflects the object shadow on a 14-in. diameter screen. The table will measure work up to 2 in.

sidewise and 1 in. backwards or forwards. Micrometer readings give 0.0005 or 0.0001 in. Projection lenses available, range from 6 to 100 magnification. The comparator is precision built throughout and a table for co-ordinate measurements can also be supplied.

New Gage Blocks

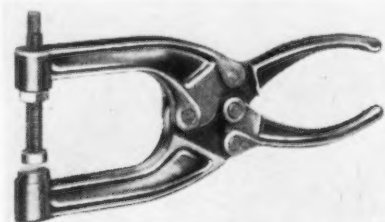
JANSSON GAGE CO., Farmington, Mich., has placed on the market gage blocks of extreme accuracy. The standard set shown contains 81 blocks with which combinations may be built up from



0.200 in. to 12.000 in. in steps of 0.0001 in. The special alloy blocks are specially heat treated to improve accuracy and life. Three grades of accuracy are available: 0.000002, 4 or 8 of an inch per inch. For longer life these blocks can also be supplied chrome plated.

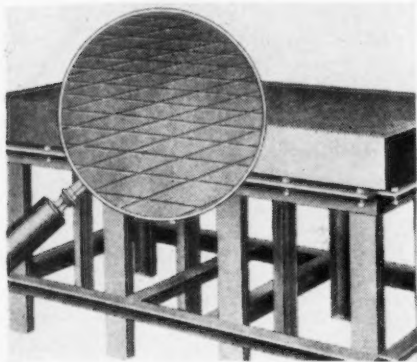
Toggle Pliers

NEW rapid action deepthroated toggle pliers for the holding together of sheets, are produced by *Knu-Vise, Inc.*, 16841 Hamilton Avenue, Detroit. The 1½ x 3-in. throat capacity of this model No. 450 permits the sheets to be held together well within their area. There is a pressure ratio of 93 to 1 and instant locking and release is provided. No creep is possible and an adjustable screw makes possible the accommodation of different thicknesses of material.



Lapping Table

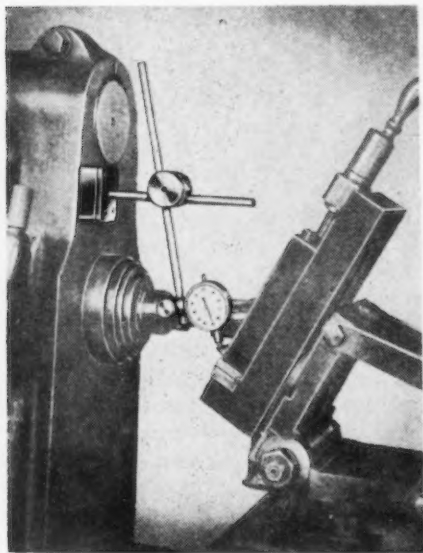
TO provide a means for accurate lapping of delicate joints, the *Challenge Machinery Co.*, Grand Haven, Mich., has designed a semi-steel lapping plate in a variety of sizes from 8 x 8 in. to 52 x 144 in. which has grooves, spaced $\frac{1}{2}$ in.



apart and criss-crossing the surface. They are used on crankcases, cylinder heads, end bells, gear housings and other parts that must be perfectly lapped to avoid oil leaks and to assure perfect fit when lapping in metal to metal joints on which no gaskets, shellac or sealer of any kind is used.

Magnetic Indicator Base

CONVENIENT stand for use with any indicator, utilizing a powerful Alnico magnet base, is being marketed by the *Mellaphone Corp.*, Rochester, N. Y. The base may be used in any position without danger of slipping or pulling off. It is sufficiently powerful to support an indicator at the extreme end of the $\frac{3}{8}$ -in. diameter post, while it is in contact with a machined or unmachined surface. The



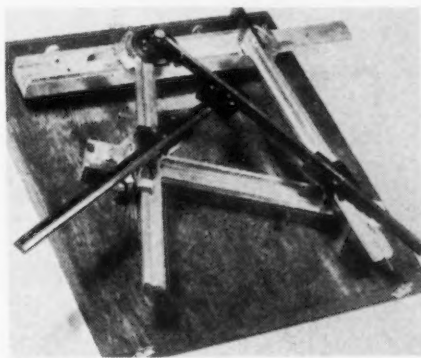
base greatly increases the applicability of the indicator. Alnico is a new magnetic material which can retain magnetism for a long time without weakening.

Adjustable Snap Gage

IN a range from 0- $\frac{1}{4}$ in. to 11-12 in., adjustable snap gages are manufactured by the *American Gage Co.*, Paterson, N. J. They are cast from an alloy insuring exceptional stiffness and strength, heat treated and seasoned. The precise measurement desired is adjusted through a screw and the measuring surfaces are ground and lapped dead true.

Determination of Triangles

FOR the solution of trigonometric problems, *Cal-Ku-Scope, Inc.*, 233 Broadway, New York, has developed an instrument which will



prove useful to construction, electrical and mechanical engineers. Its use will reduce the solution of problems in triangulation to a mere statement of the problem on the rulers and protractors which constitute the instrument. This graphic method is very accurate, giving readings by verniers down to 0.001 in. linear and 5 min. angular. The instrument can be supplied with an accuracy of 0.0001 in. Graduation can be furnished in U. S. Standard micrometer or in metric readings.

Dial Test Indicator

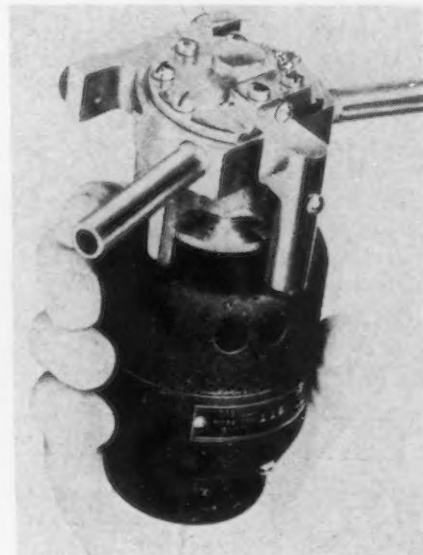
SIMPLIFIED lever movement is featured in a new GS dial test indicator by the *George Scherr Co.*, 128 Lafayette Street, New York. Instead of the usual rotating multiple gear and pinion trains, the GS indicator utilizes a lever arm. The dial is graduated in 0.001 in. with a plunger travel of $\frac{3}{16}$ in. and the movement is mounted be-



tween separate top and bottom plates and the hair spring is mounted between two flat plates. The plunger is hardened and ground and has nickel-silver bearing. A universal ball back joint can also be supplied.

Midget Pump

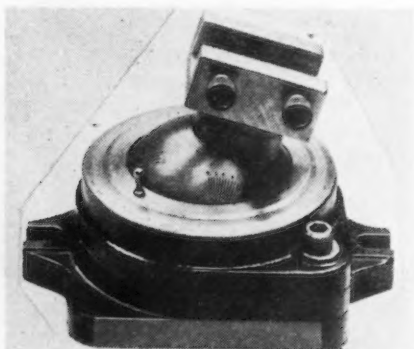
FOR the pumping of thin liquids where weight and space involved must be kept at a minimum, a new model UT midget positive pressure pump has been produced by the *Eastern Engineering Co.*, 45 Fox Street, New Haven, Conn. This rotary, self-priming pump, weighing 3 $\frac{1}{2}$ lb., is capable of a maximum pressure of 35 lb. and of output of 3 gal. per min. The 0.5-hp. motor is of the universal fan cooled



type and operates at 115 volts, a.c. or d.c. The nozzles are designed for use with $\frac{3}{8}$ -in. rubber hose only, but may be removed if pipe operation is preferred.

Ball Joint Vise

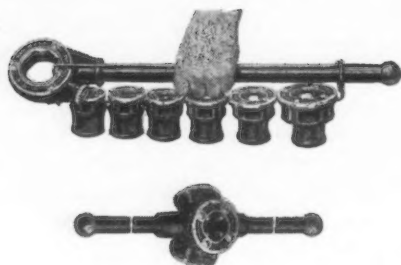
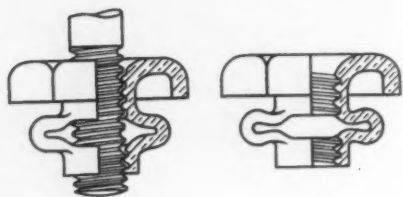
SETTING of tools for grinding of chip breakers, curlers, rake angles, etc., is facilitated and made more constant by the use of a new



time saving precision instrument, the Strickland universal ball joint vise, produced by the *Engineering Service, Inc.*, Box 44, Huntington Park P.O., Cal. Settings are instantly and accurately obtained by matching the ball joint vertical degree graduation with the horizontal and rigidly locking the vise with a single movement of the clamp wrench.

Self-Locking Nut

WING style vibration-resisting, self-locking nut has been announced by the *Scovill Mfg. Co.*, Waterbury, Conn., manufacturers and distributors for the *Aircraft Nut Corp.* When applied, the spring member of the nut expands to locking position, providing a constant tension. In addition to the vibration resisting feature, this nut presents all the advantages of the solid type, but is much lighter. It is of all-metal, one-piece construction, and reduces labor and material cost of assembly. It is made of steel and is cadmium plated.

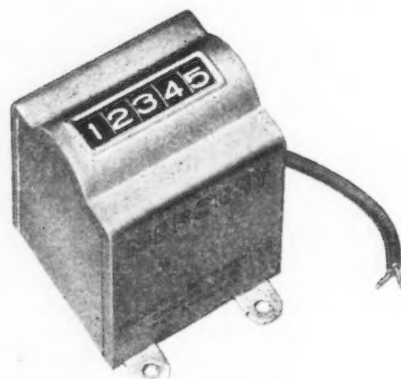


Pipe Tools

LATEST addition to the line of Ridgid pipe tools made by *Ridge Tool Co.*, Elyria, Ohio, are five new ratchet and three-way threaders for small pipe. Models 0R, 00R and 11R, will thread pipe from $\frac{1}{8}$ to $1\frac{1}{4}$ in. No special dies are required for threading close to wall. A carrier is provided which holds the ratchet ring and set of dies. Models 30A and 31A three-way threaders are similar in design to the models previously mentioned and thread pipe from $\frac{3}{8}$ to 1 in.

Compact Electric Counter

TAMPERPROOF construction, non-reset feature, totally enclosed assembly and small size are some of the characteristics of the Mercury counters announced by



the *Production Instrument Co.*, 708-16 W. Jackson Boulevard, Chicago. This low-cost magnetic counter has a very small energy requirement (about 2 watts at rated voltage) which insures long life to switch contact points and makes the instrument particularly suitable for photoelectric cell operation. These counters are tested at 600 counts per min.

Five numbers record up to 99,999 and repeat. Case and frame are of cadmium plated steel with unbreakable plastic window. Mercury counters are available for any 60-cycle voltage up to 230 and for any d.c. voltage up to 115.

Layout Stain

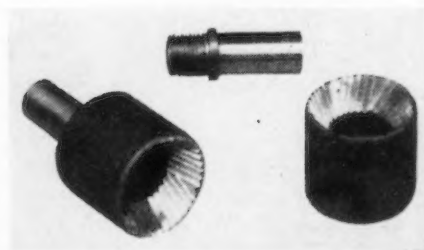
TO relieve operator's eye strain and to improve work Bex layout stain, made by *Beck Products Co.*, 915-917 Brighton Road, Pittsburgh, may be used for all layout work on brass, copper, steel and aluminum, etc. Application is simple, no polishing of surface being required. It dries rapidly and will not rub, chip or peel off. It is safe to use both for the material and the operator. The same firm produces also a stain remover to clean parts after they have been painted with the Bex stain.

Portable Cut-Off Machine

DESIGNED for ease and speed of operation, the portable abrasive cut-off machine introduced by *Quijada Tool Co.*, 5474 Alhambra Avenue, Los Angeles, will handle structural shapes and round stock and tubing up to 6 in. outside diameter. It is capable of making straight or angle cuts. Machine is equipped with a variable speed pulley to maintain rim speed of the cutting wheel constant regardless of the diameter. Quick acting vise provides rigid support on both sides of cut.

Burr Removing Cutter

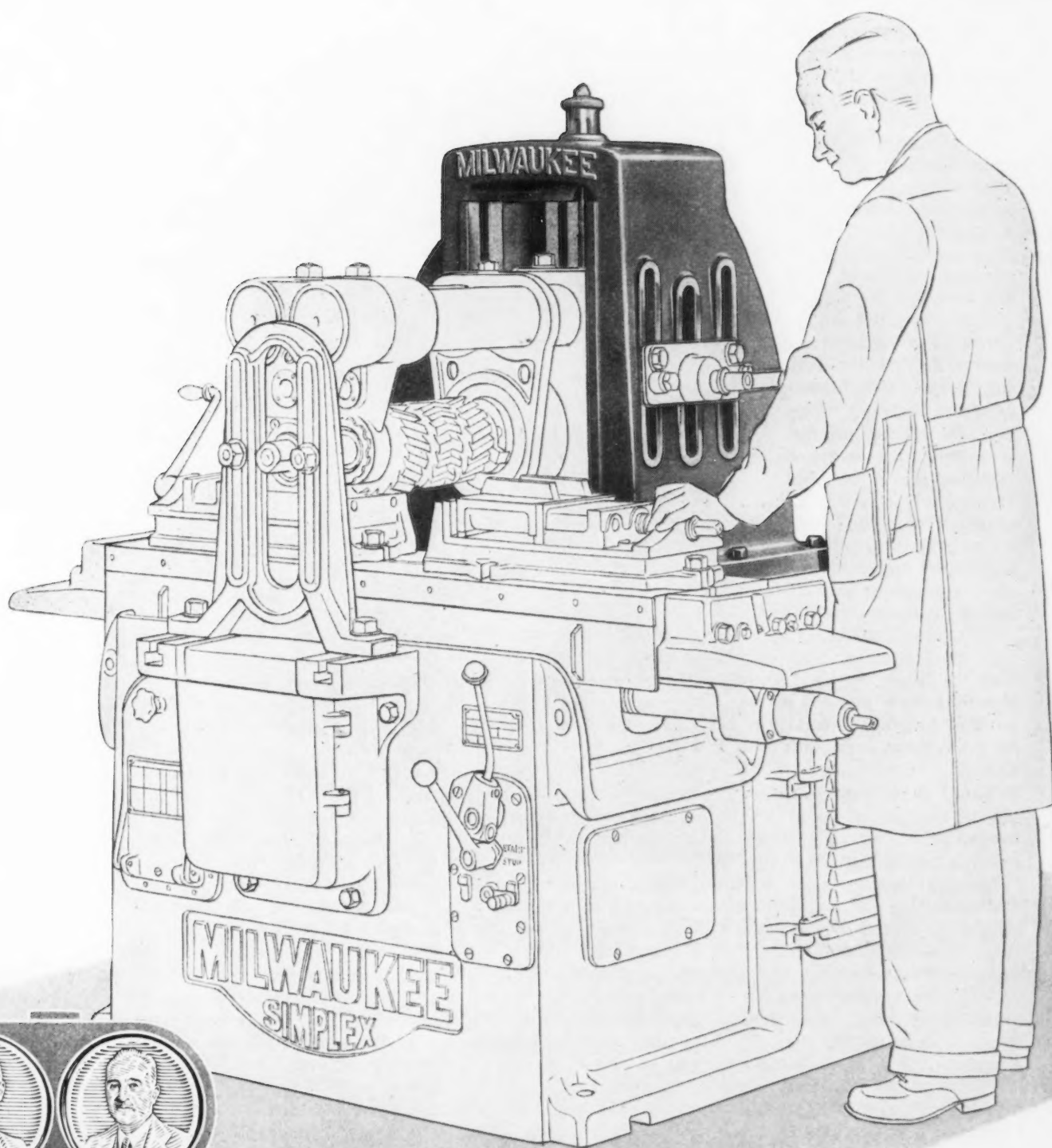
MAKERS and users of rods, shafts, splines and tubing will find useful the new burr removing cutter produced by *Severance Tool Mfg. Co.*, East Genesee Avenue, Saginaw, Mich. This tool is designed to remove rough edges, flash or burrs by producing a slight chamfer. This cutting tool has a standard mouth angle which chamfers at an angle of 30 or 45 deg. as required—other angles made to



order. Each size cutter covers rod diameters within the range of its mouth angle. The special tooth design produces a shearing cut which forces the chips away from the tool, thus preventing loading. Cutter and shank are supplied in a variety of sizes to meet all requirements.

The mounting of the spindle block — straddled by two uprights and clamped solidly together — provides a wide support base and an unusually rigid spindle structure.

KEARNEY & TRECKER CORPORATION • Milwaukee, Wis., U. S. A.



MILWAUKEE MILLING MACHINES

DETROIT—Serious efforts are being made to bring more clearly into focus the three basic elements upon which the defense program is hingeing—machines, materials and men.

The problems connected with procurement of machine tools for the defense program have probably been the subject of more thinking and planning to date than either of the other subjects. Despite concentrated attention on this one subject by plants in this area, as in the rest of the nation, not all the problems are solved, but at least industry reflects the feeling that satisfactory progress is being made.

Each of the automotive companies engaged in preparations to manufacture airplane engines, ordnance and other special military equipment has reported that schedules for delivery of plant equipment are, in the main, satisfactory. Most recent expression on this point came from Studebaker, which states that its three new aviation engine plants will receive their first shipments of machinery on May 1. Last week's "Assembly Line" gave indication that other defense plants, for instance the Chrysler tank arsenal, were also receiving sizable shipments of machinery even before the buildings were completed.

Thus, even though there are many known choke points and many spots where machines are vitally needed, the over-all picture appears satisfactory as regards machinery and tools.

Material shortages are, however, beginning to prove embarrassing. Final admission that the aluminum situation is critical came almost at the same time that it was learned in the automobile industry that aluminum priorities were on the way and that commercial users of aluminum faced an immediate reduction to about 25 per cent of their normal requirements. Those users who have been anticipating this sort of announcement may have found some way to protect themselves from the blow but some users appear to have been caught unawares because they were relying on continued normal supplies.

Unplaced as yet are many of the most important orders for aluminum to be used in the aircraft to be built through assistance of automotive plants. Briggs, Murray and Fisher have indicated, however, that requirements have been determined finally and that orders will be placed very soon. An observer would hazard the guess that even with priorities in effect there may be a scramble for this material shortly. Strength is lent to this by the fact that it has already been announced that plans are afoot for doubling the

On The Assembly Line

BY W. F. SHERMAN
Detroit Editor

• Of the three major problems of defense production, machines, materials and men, materials are now of greatest concern in Detroit area . . . Purchasing Agents Association warns against scramble for materials in which shortages are appearing.

production schedules upon which the automobile industry has made all of its estimates so far.

Packard is reported to have placed all of its contracts for aluminum for the Rolls Royce engine and the feeling here is that this organization is on safe ground. Rumors have been circulated to the effect that Packard has run into difficulties in obtaining satisfactory aluminum castings—that suppliers have conformed to all the chemical specifications set up by the British for the British design and that the resulting castings have not met physical requirements. This appears to be a fact but subject to explanations which, summed up, indicate that Packard has the situation under control and is not in danger of any delays in produc-

tion. The alloys specified by the British permit very broad ranges of the alloying materials and there is reason to believe that possibly it is just a question of striking the right combination within the permissible limits of the various elements used in the alloy.

There already is a scramble to try to find aluminum scrap. Washington attempts to scout out any hidden reserves of aluminum scrap are being made and, at the same time, industry itself is trying, apparently unsuccessfully, to find more aluminum scrap. In one instance 15,000 lb. is being sought for special automobile cylinder heads.

The material procuring problem is beginning to be felt more definitely in steel also, although in this area over-buying rather than any actual shortage is causing the difficulties. At least one steel company has attempted to correct this situation by turning back sheet orders which salesmen had taken. This rather drastic measure, certainly not one calculated to please customers, was considered necessary by the steel company because of the defense situation.

The Purchasing Agents Association of Detroit has taken a commendable step in its publication of a warning last week aimed at its own membership. *The Detroit Purchaser* asks:

"Is it good business to draw from the ladle more soup than the patient requires? Is it not time to slacken up somewhat in the scramble for more basic materials to add to stock bins? Do not fabricators as a whole have sufficient material on hand to produce the capacity for the same level as the basic material producers? Are certain industries piling inventories to the detriment of other industries?"

The *Purchaser* suggests that the steady growth of industrial stock bins for the past several months now furnishes sufficient cushion for manufacturers to open



ACCURACY...



Another kind of P&W accuracy... this time not metal finishing, but *accuracy* in the remarkable wiring of the Keller Machine's electrical brain. By now, the assembly pictured here is turning out precision dies or experimental parts for American defense.

Photograph by Kessel

breeds volume production

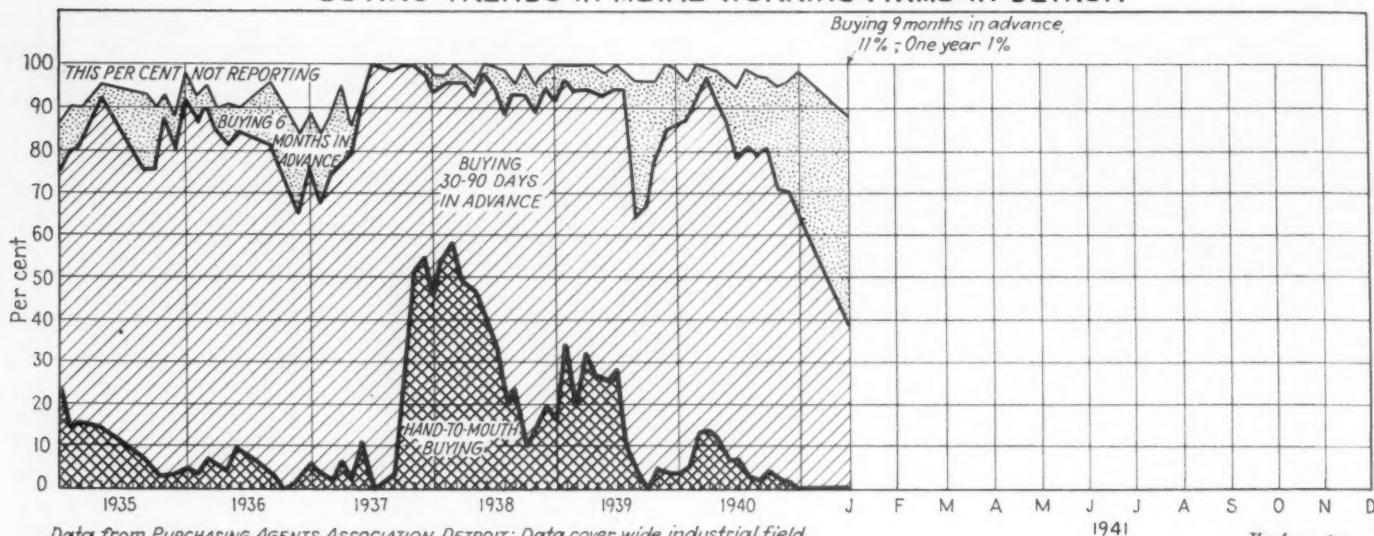
OPEN secret among tool engineers and production men is the truth that *given basic accuracy in jigs, fixtures, and gages, virtually unlimited production can roll off American assembly lines in record-breaking time.*

Over 3200 P&W craftsmen now keep West Hartford humming 24 hours a day, building this basic accuracy into machines that make machines. Engineers and tool-makers in American industry use P&W accuracy for fast expansion of top-grade production — specializing new workers, cutting waste, increasing output.

PRATT & WHITNEY

Division Niles-Bement-Pond Company • West Hartford, Connecticut, U. S. A.

BUYING TRENDS IN METAL-WORKING FIRMS IN DETROIT



Data from PURCHASING AGENTS ASSOCIATION, DETROIT; Data cover wide industrial field, including stove, refrigerator, office equipment, steel, auto parts, accessory, auto plants, etc.

1941

The Iron Age

the throttle for full steam ahead. The Purchasing Agents Association states definitely:

"We believe that buyers should concentrate on the short item and ease up to some extent on the materials that show up well in their present inventory."

For the second consecutive month the purchasing agents' survey shows that hand-to-mouth buying is entirely absent in the Detroit area. Moreover, the report for January marks the first appearance of any report by a buyer that his firm is making purchases a full year ahead. An extremely heavy concentration of buying for delivery in the second half of the year is shown in the report. Fifty per cent of the buyers say that they are aiming at the six-month mark. Another 11 per cent of the buyers put themselves in the nine-month classification. Only 38 per cent are still finding it possible to restrict themselves within a 30-90 day range.

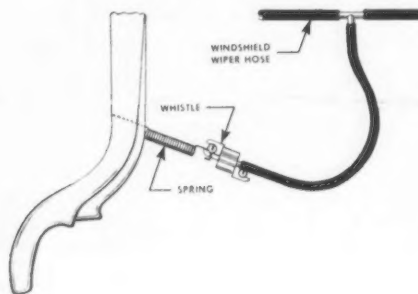
The buyers also report that commodity prices are steadily on the upgrade despite Washington restrictive actions. Fifty-nine per cent of the replies from purchasing agents said that prices were higher than a month ago; 41 per cent reported no change noted, and there were no reports of lowered prices in any field.

The inventory reports showed higher stocks in 65 per cent of the firms reporting; no change in stocks in 29 per cent, and smaller inventories in 6 per cent of the reports.

Manpower promises to be one of the most difficult of the three M's to gage. One of the most prominent executives in the auto body industry, a keen student of management-labor-production problems, is trying now to project his organization's labor requirements six months into the future. "We don't know where we can get men," is his flat statement about the subject.

Attempts are being made on a large scale to find and train the required workers. How widespread these attempts are, it is impossible to say with certainty. However,

A RUBE GOLDBERG device that has every appearance of being practical and desirable is the one pictured above to warn drivers when their hand brake is on. The device incorporates a whistle in a rubber hose that is cut into the vacuum line between the engine and windshield wiper. The whistle is attached to the hand brake lever by a spring. If the hand brake is on, the whistle is held open by the spring and sounds a shrill note as soon as the engine is started. Pontiac offers the device as an accessory.



investigation has brought up some surprising, even though incomplete, figures on this. The AMA gives specific examples: (1) A company which normally provided training for between 4000 and 5000 students annually now has more than 8000 trainees under 350 full-time instructors and is expanding facilities to train more than 10,000; (2) Another, offering more than 200 courses, which go far beyond automobile factory training and range from spare time studies to four years of engineering, has trained more than 75,000 since 1919 and is expanding now, and (3) a third company's training institute has enrolled more than 4000 since 1933. The firms referred to are Ford, General Motors and Chrysler, respectively, it is obvious.

It might be added that Chrysler has 200 foremen undergoing special training for the duties they will undertake at the tank arsenal; Packard has at least 600 men in its marine engine division training to assume responsibilities in the Rolls Royce work; Cadillac is constantly expanding and is training 2800 men for aviation work in the production of Allison engine parts. Briggs and Murray have instituted, through the Detroit public school system, rapidly expanding "vestibule" schools which in some cases actually operate in company plants to train men for employment in aviation parts manufacture and sub-assembly.

These training programs are

(CONCLUDED ON PAGE 78)



**HERE'S HOW TO GET MORE
OUT OF MACHINE TOOLS...**

... and gain extra tool room time in the bargain

A.

Suppose each tool you make could be made to produce more pieces—in fewer days—with less attention in service.

Would that give you the extra plant capacity and the extra man-hours of tool room time you need to meet today's conditions, It might not provide *everything* you desire, but it would prevent excessive interruptions to production—and it *would* reduce time spent in the tool room on the repair or replacement of worn or broken tools. Over a period, you could save enough time to account for substantial increases in plant and tool room output.

But how can you assure a better

plants are doing it by simplifying

by systematically pre-analyzing

hardening procedures. They are using

Steel Selection to do the job—and Carpenter's

tently good results.

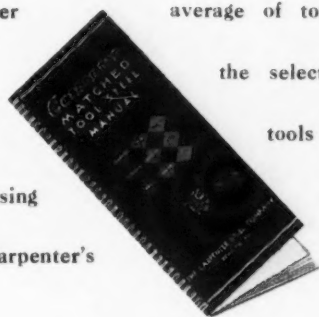
average of tool performance? More than a thousand

the selection and heat treatment of tool steel—

tools to determine the right steels and the right

Carpenter's Matched Set Method of Tool

Matched Tool Steels to insure consis-

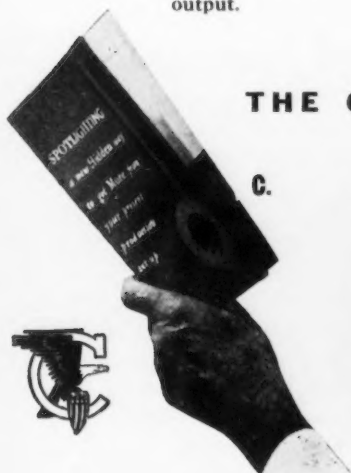


B.

With the literature shown on this page, you can easily put this method to work in your own tool room—and chances are that some of this literature is already on file in your tool room. If so, check into it now. You will be surprised at the way this system for simplifying tool room procedure fits into present needs—at the opportunity it offers for improving tools, relieving pressure on the tool room and increasing machine output.



D.



C.

THE CARPENTER STEEL COMPANY, READING, PA.

121 BERN STREET



A. Wall Chart Tool Steel Selector

B. Carpenter Matched Tool Steel Manual

C. Booklet, "How To Get More Out of Your Present Production Set-Up"

(Above literature Free to Tool Steel users in the U. S. A.)

D. Apprentice Training Book "Tool Steel Simplified" 315 Pages price \$1.00 in U. S. A.

WASHINGTON — Government economists who think that a vast expansion in steelmaking capacity is necessary if the United States is to become an adequate "arsenal of democracy" set up the premise that Great Britain must have as much steel as Hitler has. Assuming that Britain has a 17,000,000-ton capacity and that Hitler has under his control 42,000,000 tons, both in Germany and in subjugated countries, the deduction is made that Great Britain must be assured the difference of 25,000,000 tons, though some expansionists taper the total down to 18,000,000 tons, a lot of steel in either instance.

England may well take more steel this year from the United States than the 3,500,000 tons of blast furnace, steelworks and mill products that she took last year and also require more steel in the form of completed products, such as requirements for machinery, guns, ships, etc. This view is predicated on continuance of the war through the present year. In Washington there are sources whose growing belief is that the war will be ended with a British victory before the year is ended.

But the idea that such enormous shipments as are suggested are necessary is unsound for several reasons.

Required Shipping Not Available

First, there will not be available the required shipping capacity to move the material to England. Some expansionists apparently think that "all out aid" to Britain will include "lending or leasing" of American coastwise vessels, a point that, right or wrong, is generally considered far-fetched. Even with this added bottom capacity it is doubted that it would be adequate to move such large tonnages, granting there are sufficient convoys for the merchant vessels. Expansionists, considering use of American coastwise vessels, seize upon this point as one of their arguments for more capacity. They maintain that while more steel would be exported, thus increasing demand on the industry, it would be necessary to turn to railroads to move traffic that had to be withdrawn from coastwise shipping and this would mean building up rail shipping capacity by greatly increasing railroad rolling stock and with it large requirements for steel. All this sounds highly theoretical, if not fantastic. Nevertheless the views have found expression in government circles.

Second, England does not have sufficient finishing capacity to process into final form such large steel ton-



• Government economists hold U. S. must help Britain match Germany in steel, pound for pound . . . Industry itself sees this a war of "special steels," not a tonnage war as in 1914-18.

nages as it is contended must be shipped in addition to the completed military products, into which American steel will go.

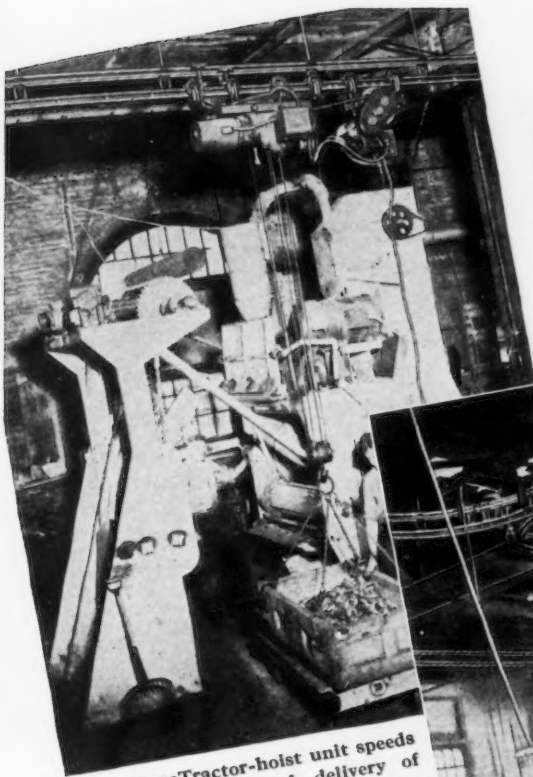
Third, this war has taken a lot of steel and will take vast additional quantities, both for the United States national defense and for Britain. Nevertheless this is not a tonnage war as was the first World War. The carbon steel tonnage required and to be required will fall short of capacity. The pressure on steel where it prevails lies in the fact that it rises from concentrated demand and once the hump has been passed over there will be more than ample capacity. In fact there are examples today where defense steel deliveries are being held because government projects are not sufficiently advanced

to use the steel.

This is a war of special steels and light non-ferrous metals, and it might well be that further expansion for this kind of capacity, as distinguished from open hearth and Bessemer capacity, will be recommended and built. Further West Coast expansion might also be under consideration. Just now expansion of capacity for and conservation or substitution of non-ferrous metals is being pressed. Rationing of civilian requirements likewise is in the picture and to a lesser degree this movement applies to tonnage steel and may be intensified pending supplies that, due to simultaneous defense demands, have built up peak loads. Already, according to reports reaching Washington, mills are watching commercial orders carefully, cutting them down where they are considered to be unnecessarily large, and stocks at consumer plants are also being checked. The point is made that excess commercial demands and inventories could easily bring about a system of rigid priority control which the government as well as the industry is seeking to avoid.

Demand Grows for Special Steels

Greater mechanization has vastly increased the importance of and demand for special steels and light non-ferrous metals for war use. Tanks, aircraft, armor piercing shells, more and stronger armor all are drawing heavily on alloy steel and light non-ferrous metal supplies. And it may be said that, whatever temporary advantage Hitler may have in the way of steel capacity near at hand, it is more than offset by what England has and can get from the United States in the way of special steels and non-ferrous metals, to say nothing of supplies of oil that is so vital to mechanized war. Hitler is comfortably fixed respecting bauxite resources for aluminum production

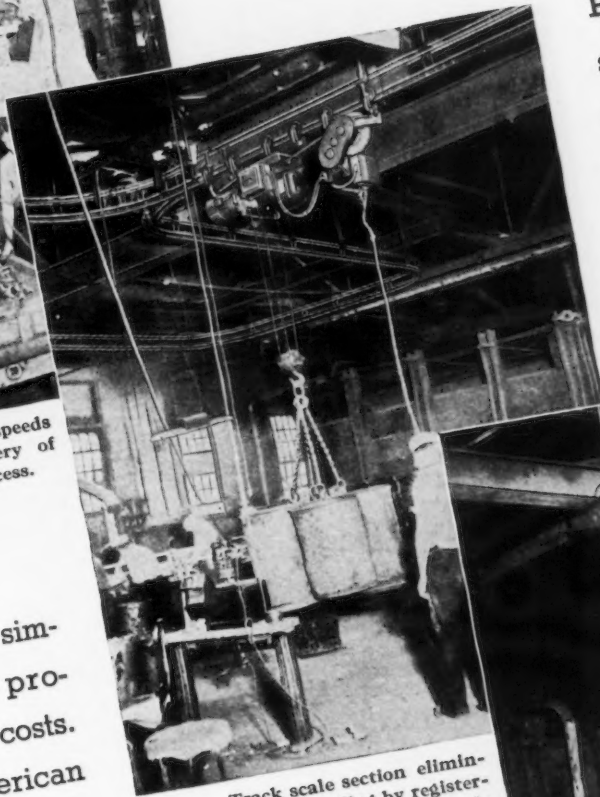


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and that is about as far as he has assurance for light metal supplies. Even here building up of finishing aluminum capacity in the United States now is under way and when completed the aluminum problem will be solved.

There is under construction or planned for early construction about 3,000,000 net tons of new open hearth and Bessemer steel capacity. New electric furnace capacity, some already installed, involves 400,000 tons or more. By the end of the year the rated ingot capacity, it is estimated, will be about 87,000,000 tons and ingot production, it is predicted, will reach the unprecedented total of approximately 82,000,000 tons.

Hence, there is the belief in the industry that tonnage steel capacity not only will greatly exceed defense needs for both the United States and all that can be shipped to England but that civilian requirements also not only will be met fully but that the industry will again be looking for commercial business.

All Magnesium is Allocated to Defense

Washington

• • • Steps to safeguard aluminum and magnesium supplies, involving a reduction in the use of these metals for non-defense purposes, were urged last week by the Priorities Division of the Office of Production Management. In this connection voluntary action was sought from magnesium producers, aircraft manufacturers, and industrial consumers of aluminum going into non-defense products.

Magnesium producers were asked to allocate all their stocks to defense industries for the time being, aircraft manufacturers were requested to save scrap aluminum for return to the original source of supply, and industrial users of aluminum going into non-defense production were urged to scrutinize the use of substitutes including plastics. It was explained that in making its recommendations for finding aluminum substitutes, the Priorities Division

is not yet ready to make any formal priority ruling.

The "present situation" in magnesium supplies was attributed to "rapidly increasing demands of the defense program, together with certain other unfavorable factors." Lack of aluminum was described as resulting from sluggishness in the development of expected power sources and a cutting off from Switzerland of aluminum used as a de-oxidizing agent in steel manufacturing processes.

Director of Priorities Edward R. Stettinius, Jr., sent a letter to major aircraft plants, emphasizing the necessity of instituting "all measures for salvaging existing supplies."

"Under these circumstances, the Priorities Division, on recommendation of the Aluminum and Magnesium Priority Committee, desires your cooperation in suggesting what in your opinion would be the most practical and desirable procedure for handling scrap," Mr. Stettinius wrote.

"Furthermore, until the Priorities Division can determine what in its opinion is desirable policy in this matter, it requests that all high strength alloy sheet scrap be held for later return to the source from which the original supply was shipped to you."

THE BULL OF THE WOODS

BY J. R. WILLIAMS



Washington

• • • A separate defense housing insurance fund of \$10,000,000, a \$150,000,000 appropriation for direct federal construction of defense dwelling units, and \$6,750,000 additional for temporary shelter in areas where ordinary construction procedure is not fast enough, will be recommended to Congress by Defense Housing Coordinator C. F. Palmer.

Designed to expedite participation by private industry in the defense housing program, the proposal to establish the \$10,000,000 insurance fund would be used to underwrite \$100,000,000 in mortgages on one to four-family dwelling units in defense areas. To take the form of an amendment to the Federal Housing Act, the revision would insure loans to builders up to 90 per cent of the FHA's appraised value of the property on dwellings ranging from \$4000 to \$10,500 in cost.

More Speed Sought in Structural Deliveries

Washington

••• Confidence that the structural mills and fabricating shops will be able to meet defense needs without the imposition of priorities, despite concentration of demand, was expressed as the result of a meeting in New York on Tuesday of last week between representatives of major steel companies and Samuel S. Stratton, General Assistant Director of the Minerals and Metals Section of OPM's Priorities Division. Renewed effort to stimulate deliveries was determined upon and application of the program in the estimation of both officials of the Priorities Division and of the steel companies will make it unnecessary to impose priorities.

In announcing the conference, called to expedite the flow of structural shapes into defense construction, OPM Director of Priorities E. R. Stettinius, Jr., explained that the steel producers said that they were already giving preferential treatment to defense orders and that they agreed that an even greater effort would be made to fill defense orders first. This, Mr. Stettinius pointed out, will be done on a voluntary and informal basis.

"The major problem discussed involves the fact that a temporary tightness has developed in the delivery of structural steel shapes needed generally for defense construction, including the expansion of aircraft plants, automobile factories, military cantonments, and machine tool plants," said Mr. Stettinius.

"The situation has become particularly apparent during the past few weeks with statements from both defense and non-defense users of shapes that they are having some difficulty with deliveries.

"At the New York conference, representatives of the mills, which are working at near capacity, said they expected that most defense orders for shapes would be on their books by early summer. This would indicate a tapering off of such orders after that time and an easing of the situation.

"If the new effort to expedite defense deliveries is successful, officials of the Priorities Division believe that the imposition of formal priorities for such orders may be avoidable."

Attention



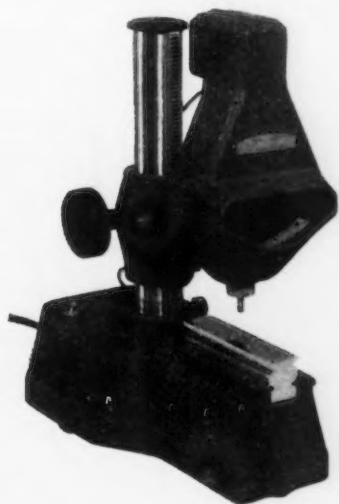
The attention of industry is being called emphatically to the urgent need for accurate and rapid inspection at tolerances never before encountered in a period of rapidly expanding production.

In order to handle this tremendous volume of gaging operations with the highest degree of precision, gages such as the Sheffield Visual Gage are absolutely essential. The Visual Gage is highly sensitive, instantaneous in its action and dead accurate (checking to thousandths, "tenths" and millionths of an inch). It is used for checking dimensions of manufactured and purchased parts, tools, production and master gages.

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The Reed Mechanism (the heart of the Visual Gage) is positive in action and entirely free from the limitations of frictional wear. It contains no gears, knife edges or rubbing contacts—nothing to wear out of adjustment. Measurements by the Visual Gage are always consistent and thoroughly reliable. It is one of the most efficient instruments available to inspection.

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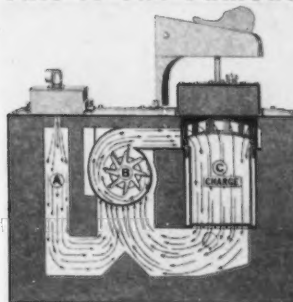
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News of Industry

G-M Union Asks Pay Increase Of 10c. An Hour for 160,000

Detroit

••• A general wage increase of 10c. an hour to more than 160,000 General Motors employees is to be one of the demands made by the UAW-CIO in a proposed new contract which will be presented to the corporation in negotiations soon to open. Delegates of all of the UAW-CIO G.M. locals met in Detroit during the week-end to lay plans for the forthcoming negotiations.

G-M Hourly-Rated Workers Averaged \$1,804 in 1940

••• The average annual income of the regularly employed General Motors Corp. hourly-rated workers in 1940 was \$1,804 compared to \$1,503 for 1939, an increase of 20 per cent. These regularly employed workers averaged 1,823 hours of work during 1940 compared to 1,585 hours during 1939, an increase of 15 per cent. Six out of every ten regularly employed workers worked more than 1,800 hours in 1940 and the average income of this group was \$1,993 for the year.

Verson Allsteel Press To Lift Output 40%

Chicago

••• Verson Allsteel Press Co. has undertaken a \$365,000 expansion program, calculated to step-up production by 40 per cent. About \$140,000 of new equipment has already been installed, and an additional \$160,000 worth of machinery is on order. The firm will also construct a 60 ft. x 500 ft. plant addition, at a cost of \$65,000.



WARSHIP AT CLEVELAND: The U.S.S. Locust, a net tender, shown going down the ways of the American Shipbuilding Co. at Cleveland—is the first of 12 war vessels to be launched there. The tender will go into ocean service to lay steel nets designed to protect the Panama Canal and seaboard harbors from submarines. (The Locust is 150 ft. long, 30.6 ft. wide, 16 ft. deep, powered by a 1000 hp. Diesel engine).

By Wide World

250 Study in Alabama Metallurgical Courses

Birmingham

••• Approximately 250 persons are enrolled in four courses in metallurgy, which are being taught at the University of Alabama center here under government sponsorship. The courses include a review of the principles of metallurgy in the making and shaping of steel.

Unitcast Buys Equipment To Increase Production

Toledo

••• Unitcast Corp. here is purchasing additional equipment for its steel foundry in order to insure a steady production at peak capacity, according to R. F. Tillman, president. Other departments in the plant will require new equipment or extensive rebuilding of present equipment. Probably a sum not exceeding \$100,000 will be spent. The company's plant was greatly enlarged during 1936 and 1937 and is operating at close to its maximum capacity.

Flanders Administrator Of Tool Priorities Group

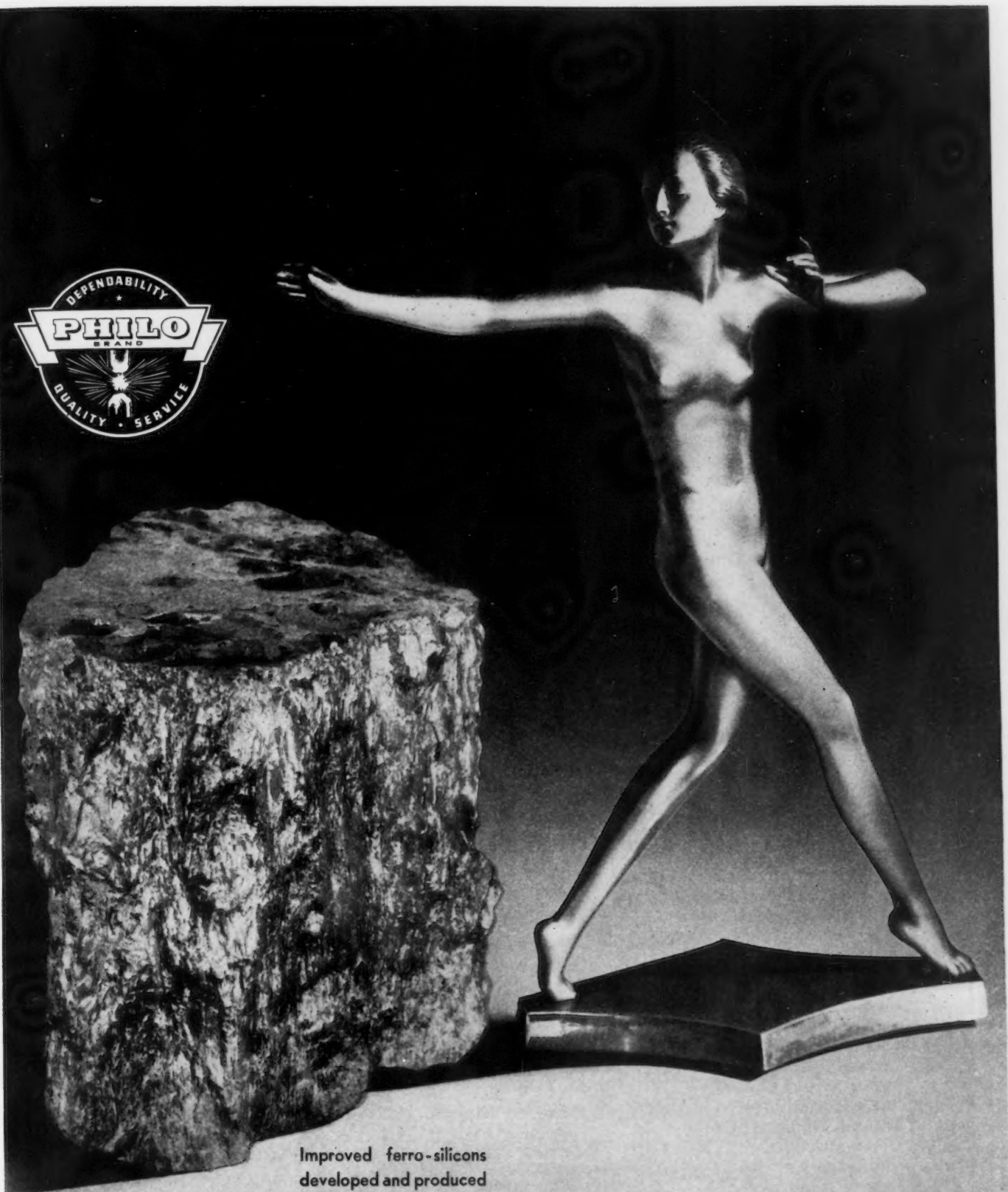
Washington

••• Ralph E. Flanders, president of the Jones & Lamson Machine Co., Springfield, Vt., has been appointed group administrator of the Tools and Equipment Section of the Division of Priorities of the Office of Production Management. Mr. Flanders will work in cooperation with D. S. Kimball, Tools and Equipment Priority Executive, who is in charge of all operations of this section. W. E. Wickenden, president of the Case School of Applied Science, Cleveland, has taken up his duties as General Products Priority Executive.

1457 Workers Reported Available at Akron

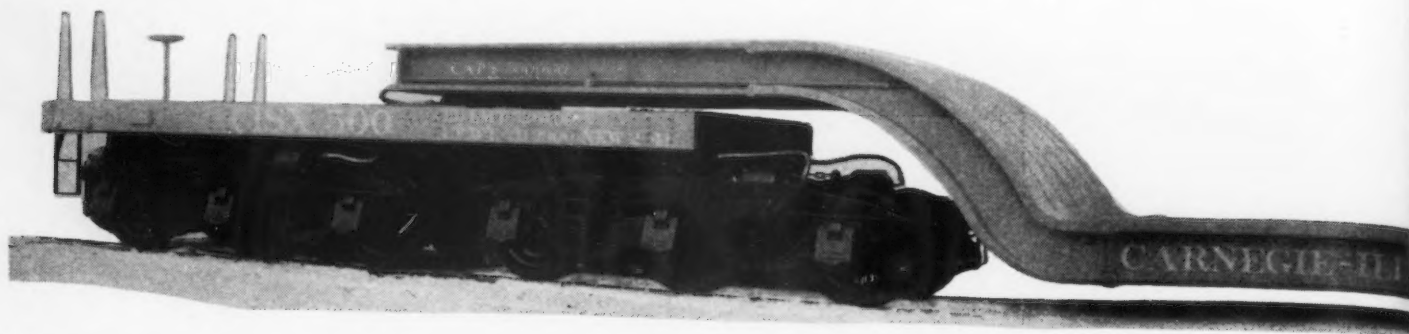
Akron, Ohio

••• Akron has 1457 workers with primary skills available for employment, a recent survey shows. According to a similar statewide inventory by the Social Security Board there are 17,555 workers with primary skills registered in Ohio.



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Giant Flatcar Hauls Armor Ingot Molds

Pittsburgh

• • • Although primarily designed by Greenville Steel Car Co., Greenville, Pa., to transport exceptionally large ingot molds used in the production of ingots for armor plate work at one of Carnegie-Illinois Steel Corp.'s Pittsburgh district plants, the 250-ton capacity flat car shown above suggests possibilities of a far wider application for the national defense program.

This flat car which is claimed to be the world's largest and which weighs 313,900 lb., has a load limit of 526,100 lb., a total rail load of 840,000 lb., and an overall length of 90 ft. It successfully negotiated a 44 deg. curve which is sharp enough, it is said, to enter almost any industrial plant. It is also claimed that no restrictions for clearance or speed in main line service is necessary.

The special design of this 250-ton depressed flat car was necessitated by transportation problems within the Carnegie-Illinois plant involving proper clearance to move under railroad bridges and in shops. The platform height of the new car is approximately 18 in. lower than standard equipment. While there is nothing unusual in the size of the ingot molds which will be hauled by this car, the crux of the problem faced by plant engineers was the transportation involved. Due to the tremendous weight of the ingot mold no existing railroad equipment was large enough or of the correct type to move the mold from one plant to another.

Before making final plans on ex-

panding its facilities for armor plate at its Clairton works, Carnegie and Greenville Steel Car engineers had to break new ground in a design of the unusual mold carrying unit.

Transportation and steel circles point out that the problems encountered in the movement of ingot molds of such a tremendous weight and size will be no different than those which will arise many times in the near future in the correct and proper transportation of national defense items. Hence this engineering achievement is looked upon by some as eventually reaching far wider applications than originally intended, as for example large machine tool housings, gun carriage equipment, guns, tanks, fabricated parts, etc. It is said that this car, compared with other large units which have less than 1/5 of its capacity, could be hauled thousands of miles over transportation facilities in use today which are capable of withstanding the tremendous rail load.

The body of the car utilized U. S. high tensile steel, welded throughout.

Hudson Already Making Ailerons for Planes

Detroit

• • • The new aircraft division of Hudson Motor Car Co. is already in production of ailerons for an Eastern airplane manufacturer, it was announced last week by A. E. Barit, president of Hudson. Plant operation in the aircraft division is in charge of George Goin, who for approximately ten years was in charge of airplane production for Ford Motor Co.

250-TON FLATCAR: Because no existing railroad equipment could haul heavy molds needed for armor plate ingots, this

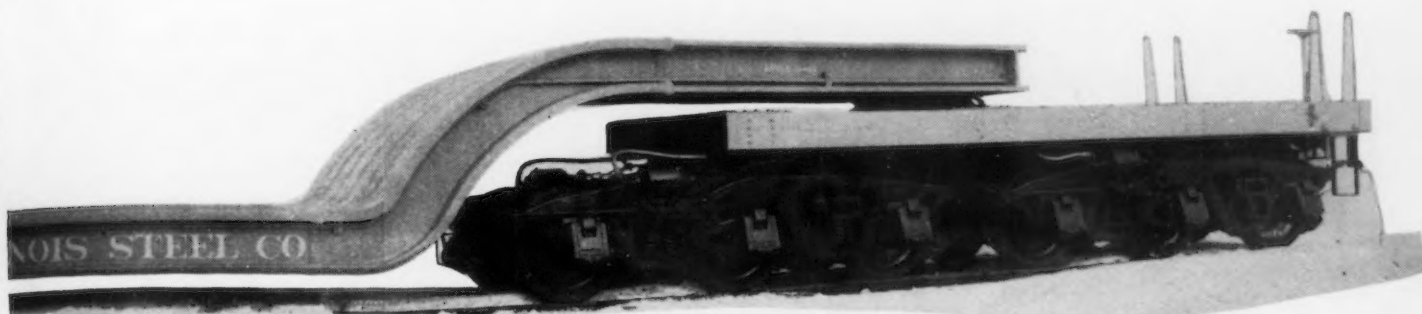
Sellers Mine Leads In Mesaba Shipments

Cleveland

• • • In its annual report on mine shipments the Lake Superior Iron Ore Association here shows that the Sellers Mine was the leading shipper from the Mesaba range with 5,784,048 gross tons, followed by the Mahoning property with 5,177,201 gross tons. Mesaba Mountain mine shipped 4,330,739 tons followed by Hull Rust with 3,901,971 tons and Hill Annex with 2,991,068 tons. Season's shipments from the Sellers Mine showed a gain of around 3,880,000 tons compared with the amount produced in 1939 when the mine was in fifth place on the range.

The report shows considerable change in the operations on the Mesaba range in 1940 compared with 1939. Among mines not listed as shipping from this range in 1939, the Coons mine shipped 267,453 gross tons in 1940, while Corsica shipped 679,358 tons and Holman-Cliffs shipped 425,274 tons. All told there were around a dozen mines which resumed in 1940 on the Mesaba range.

While there will be additional resumptions on the Mesaba range in 1941, the majority of mines which could resume shipments from the Lake Superior Iron Ore district are on the Marquette and Menominee ranges. It is expected that on the latter range the Ravenna-Prickett which shipped 62,082 tons in 1940, will step up its deliveries appreciably in 1941. Total shipments from the Mesaba range in 1940 were 45,667,677 gross tons.



car, claimed to be the world's largest, was built for Carnegie-Illinois Steel Corp., during recent months.

On the Vermilion range out of a total of 1,547,469 tons shipped, Pioneer shipped 560,467 tons and Zenith mine shipped 450,808 tons. On the Cuyuna range with a total of 1,734,176 tons Mahanomen shipped 433,993 tons followed by Sagamore with 255,544. On the Gogebic with a range total of 5,975,727 tons Montreal mine produced 999,402 tons; Plymouth 706,658; Newport 605,983; Penokee Group 600,559; Sunday Lake Mine 572,306 tons.

On the Marquette range ore shipments totaled 5,920,463 tons; Maas Mine produced 950,426 tons; Negaunee 930,640 tons; Athens 668,009 tons and Cliffs-Shaft 611,891 tons.

On the Menominee, which shipped a total of 3,103,334 tons, Penn Mines shipped 661,924 tons; Davidson Group 300,920 tons and Bengal 280,945 tons.

Shipments of beneficiated ore from Minnesota totaled 25,551,722 tons in 1940 against 16,064,607 tons in 1939. Beneficiated shipments from Michigan and Wisconsin totaled 4,262,268 tons against 3,696,507 tons in 1939.

46 Housing Projects Under Way for Navy Department

Washington

• • • A tabulation of Navy construction by Defense Housing Coordinator C. F. Palmer shows that 46 different projects in 42 localities of 23 states are under way. The projects will accommodate 70,000 persons and will cost \$47,112,878. The construction involved does not include cantonments or barracks, Mr. Palmer said.

Ford Boats Haul 701, 916 Tons of Ore

Dearborn, Mich.

• • • The Lake fleet of the Ford Motor Co. has just concluded the longest navigation season in its history, operating in and out of the River Rouge plant two weeks longer than any previous season.

During the 1940 season 3,613,583 tons of cargo were transported. Nearly half of the cargo arriving at the Rouge docks was coal. Ore shipments amounted to 701,916 tons, a considerable increase over the 412,040 tons in 1939. Also included in the 1940 cargo were 359,827 tons of foundry sand, 301,773 tons of lime-

stone, 19,175,220 lb. of crude rubber and 15,474,762 board feet of lumber. Outbound cargo from the Rouge included approximately 50,000 tons of automobile parts consigned to assembly plants.

Schwartz Says Scrap Men Oppose Price Spirals

• • • With a backlog of one billion tons of steel in use, whose return to the scrap heap can be speeded by proper organization, the scrap industry can assure the supply of 29 million tons of open market scrap to the steel industry during 1941, or an increase of approximately five million tons over 1940, it was stated by Benjamin Schwartz, formerly director general of the Institute of Scrap Iron and Steel and vice-president of Schiavone Bonomo Corp., at the annual convention of the Oklahoma Scrap Dealers Association, at the Mayo Hotel, Tulsa, on Feb. 9.

The scrap industry is overwhelmingly in favor of the administration program to aid Britain as a measure of national defense, and of the policy to prevent inflation by sharp price spirals, Mr. Schwartz said.

"The problem is not one of price," said Mr. Schwartz, "it is one of getting out the scrap and serving the steel mills. The scrap industry represents the most efficient collection and distribution machinery in the United States for any raw material; it is important that the machinery be harnessed to the national defense program without disrupting the organization or driving any part of the 200,000 people who make up the industry into more lucrative fields."

Coming Events

Feb. 27 to 28—American Hot Dip Galvanizers Association, annual meeting, Pittsburgh.

March 4 to 5—American Society for Testing Materials, spring meeting, Washington, D. C.

March 13 to 14—Society of Automotive Engineers, national aeronautic meeting, Washington, D. C.

March 25 to 29—American Society of Tool Engineers, Machine and Tool Progress Exhibit, Detroit.

April 16 to 18—Electrochemical Society, Inc., spring meeting, Cleveland.

April 23 to 25—Concrete Reinforcing Steel Institute, annual meeting, Hot Springs, Va.

May 5 to 7—American Gear Manufacturers Association, annual convention, Hot Springs, Va.

May 12 to 15—American Foundrymen's Association, annual meeting, New York.

Coordinated Training Program Is Launched in Chicago Area

Chicago

••• The nationwide pinch for skilled men to carry on preparedness production is being met here with one of the broadest training programs the Chicago and Illinois industrial area has ever known. Shortage of skilled men for established firms here will be even more sharply felt when the two new aircraft engine plants to be operated by Studebaker and Buick get into production sometime this

summer. Consequently, through the offices of the state manufacturers' association, the "Training-Within-Industry" program of the labor division of the National Defense Advisory Commission and the efforts of other manufacturers' and trade associations are being pooled to speed up the training of young boys, as well as men already working in metal shops.

Although the various training schools and other educational in-

stitutions are doing a creditable job, the major task of emergency training lies with the manufacturer himself. "This is essentially an internal problem," says James D. Cunningham, president, Republic Flow Meters Co., and chairman of the committee on vocational education of the Illinois Manufacturers' Association. "The manufacturers can train men in conformity with the conditions and circumstances that obtain in his own industry." Cunningham urges every prime and secondary defense contractor to survey carefully his skilled and semi-skilled labor requirements for defense and undertake the necessary measures calculated to meet the need.

Chicago industrialists have found that the principal labor shortage exists in such lines as machinists for precision work, tool and die makers, screw machine operators, milling machine operators, tool designers, sheet metal workers, welders, draftsmen and molders. Actually there is a growing shortage in almost all branches of the metal trades.

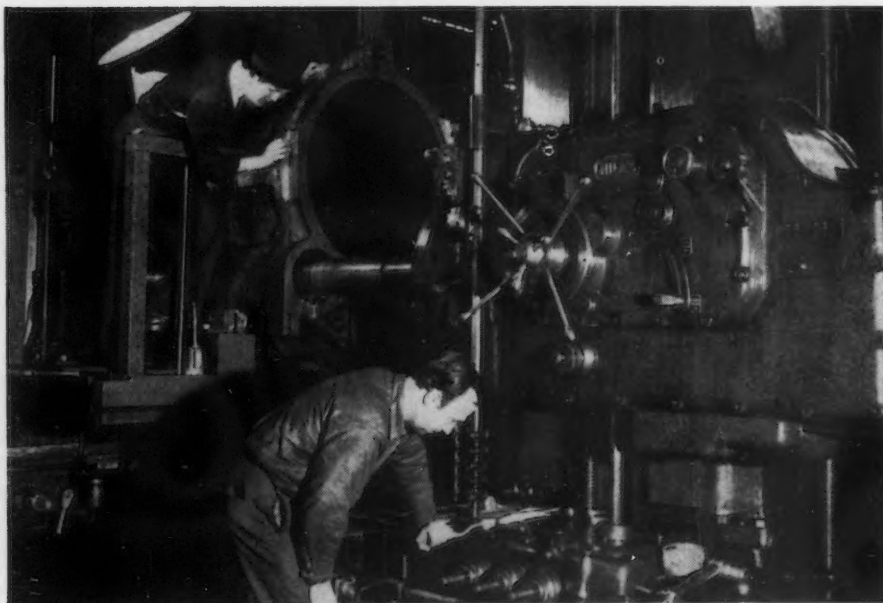
Most Illinois manufacturers have been found to be meeting the training need in any one of the following methods:

1. Increasing supply of skilled mechanics through intensive training of semi-skilled men and of men whose skill has been impaired by unemployment.
2. Single machine or operation training as far as is practical in the plants. Complex jobs are broken down into single component operations as a means of providing short-term instruction to unskilled and semi-skilled workers.
3. Developing semi-skilled specialists to operate the simpler type of machines.
4. Building up supervisory staffs adequate to handle increased production as well as to instruct trainees by expanding foreman training programs.
5. Outlining for vocational schools the type of training required by local industries.
6. Extending existing apprentice training programs and inaugurating new programs in factories where they do not now exist.
7. Cooperating with trade organizations in establishment of courses for employee training.

FIRST SINCE 1918: These are photographs of the first 8-in. railroad gun manufactured in the U. S. since 1918. The 225,000-lb. weapon, made at the Baldwin Locomotive Works at Eddystone, Pa., can hurl a 260-lb. shell 18 miles. Final tests will be made at the Aberdeen (Md.) Proving Ground.



Photos by Wide World and International



8. Working with State Board of Vocational Education which has established a well-planned industrial training program in the technical public schools throughout the state, especially in the important industrial areas. This program includes instruction of new students and retraining of men who lost their mechanical skill during the depression years.

9. Cooperating with efforts by the Labor Division of the Advisory Commission of the Council of National Defense.

10. Developing help in engineering fields as well as managerial practices through the agency of such institutions as the Illinois Institute of Technology which has 1000 students taking a 20 weeks' course in 16 major subjects.

Trade associations are doing their part, too. The National Metal Trades Association, long active in training programs, has just issued a new book, "Machine Shop Instructor's Manual." Instruction outlines are given for 14 different operators' jobs such as drill press, engine lathe, milling machine, surface grinder, planer, etc. Included, too, are chapters on machine tool operations and hand tools. The Metal Trades Association has also issued a Conference Leaders' Manual, which recognizes the value of the foreman in the training program. "Machine Shop Technology" and "How to Read Blue Prints" are supplementary volumes offered by the association.

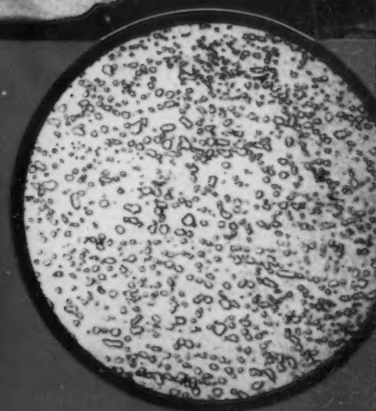
The public technical and vocational schools currently show an enrollment of 6798 in the state, training in such subjects as auto mechanics, wood shop, machine shop, pattern making, sheet metal, electrical, drafting, foundry, welding, aircraft engine and forging. Almost half of the total enrollment in these public technical schools is receiving supplementary training to the jobs now held.

Schools in different sections of the state concentrate on different subjects, depending upon the immediate needs of the community served. Chicago schools have been asked to play an important role in the training of youths for two new Buick and Studebaker aircraft engine plants, and both companies are reported to be sending trained men ahead to Chicago to instruct students in the technical



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SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

WARREN, OHIO

Do you lift at your work?

If your daily task calls for the lifting of fairly heavy weights, consider what it would mean to your health, comfort and efficiency if your employers installed electric 'Budgit Hoists'. No more overtiredness or danger of strain and rupture! You could do more productive work with much less effort.

Tell your foreman or superintendent to look into these inexpensive hoists that can be hung up, plugged into any electric socket—and immediately go to work.

'Budgits' are portable electric hoists that come in lifting sizes of 250, 500, 1000 and 2000 pound capacities at speeds that suit today's tempo. Prices start at \$119.

Send for catalog containing complete information, also, "Time Saving Calculator" that shows savings they earn.



'BUDGIT' HOISTS

SHAW-BOX CRANE & HOIST

DIVISION OF

MANNING, MAXWELL & MOORE, INC.

930 BROADWAY, MUSKEGON, MICHIGAN

Makers of all types and sizes of Electric and Hand Operated Cranes and Electric Hoists. Send all your crane and hoist inquiries to Shaw-Box!



CHARCOAL-BURNING motorcycle: Paris citizens, forced to seek new sources of fuel, are utilizing motorcycles equipped (above) with a device that burns charcoal to supply the needed motive power.

Photo by Wide World

courses. Both educators and industrialists point out that school instructors must know definitely what jobs the students will handle when regular employment is accepted.

The "Training-Within-Industry" program of the labor division of the National Defense Advisory Commission has also set up a plan designed to fit in with this general training movement. Sears, Roebuck & Co. has loaned Paul A. Mertz, to act as representative for the federal program in the Greater Chicago and Illinois district. Purpose of this movement is to assist defense contractors by advising them on the best methods of training their own men within their own plants. To this end, a panel of 19 advisers, composed of training experts from leading companies, has been set up. Companies like Inland Steel, Harnischfeger Corp., Western Electric, International Harvester, Pullman-Standard Car Mfg. Co., Kearney & Trecker, etc., have lent their personnel or industrial relations directors to the "Training-Within-Industry" program—all of these men serving without pay. The division has issued helpful bulletins which discuss details of intensive training which are available to any manufacturer. The avowed purpose of this group is to help industry in the job of employing partially trained men from

schools or untrained men from the ranks of the unemployed. Through quick training programs, men can be made productive in simple parts of a job within a few weeks or months so that skilled men can be confined to highly skilled work exclusively.

The combined efforts of industry, schools, trade associations and government are expected to provide the state with the greatest number of workers in the shortest time in Illinois' history in this concerted drive to push the defense program along.

Acetylene Association Convention Postponed

• • • Announcement has just been made that the 41st annual convention of the International Acetylene Association, originally scheduled to be held at the Hotel Netherland Plaza in Cincinnati on April 2, 3, and 4, has been indefinitely postponed. The action by the association's board of directors has been taken because of the increasing demands upon the time of engineering personnel in the industry, and the growing feeling that technical and other manpower, normally applied to convention activities, should be released for work more urgent under today's conditions.

Sales of Electric Trucks Best in Several Years

December, 1940, domestic bookings of electric industrial trucks and tractors were the highest in any month for a number of years, according to figures released by the Industrial Truck Statistical Association, 208 South La Salle Street, Chicago. Bookings totaled 301 units booked compared with 249 in November.

Total net value of chassis only booked was \$1,069,902.75, compared with \$827,003.73 in November.

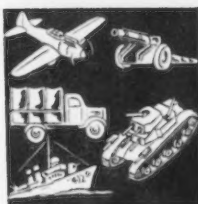
Cantilever trucks totaled 270 units, with capacities and base prices ranging from 1000 lb. to 20,000 lb. and \$1,750 to \$12,390, respectively, and had a total net value of \$973,615.25. All net values given are at factories, after additions and deductions for variations from standard specifications, trade-in allowances, etc., when applicable. There were also 14 non-elevating platform trucks with capacities and base prices ranging from 2000 lb. to 6000 lb. and \$1,630 to \$2,650, respectively, with a total net value of \$31,622.50; eight crane trucks, capacities and base prices ranging from 3000 lb. at 7 ft. to 6000 lb. at 7 ft. radius and \$4,980 to \$5,840, had a total net value of \$41,450; six tractors, capacities and base prices ranging from 475—2000 lb. to 6000 lb. draw bar pull and \$1,475 to \$3,505, had a total net value of \$12,265; three special non-load carriers with a base price of \$3,650 each, had a total net value of \$10,950.

Steel Capacity in U. S. Could Handle "All Peaks" at Once

• • • If the peak annual domestic demand ever recorded for each of the 17 principal classes of steel products had been experienced in the same year, the steel industry could have taken care of this demand by using only four-fifths of its present steelmaking capacity, according to the American Iron and Steel Institute.

Actually, the records show, the 17 principal classes of steel products reached their individual peaks in nine different years scattered between 1906 and 1940. Not more than three products met their peak demand in any one year, indicating that records for steel production have rarely been established in more than a few products at the same time.

MORE IMPORTANT THAN EVER



—Parts Like These, supplied by Hubbard for products and mechanisms that must be more dependable than ever.

Hubbard makes them—
Springs, Spring Parts,

Small Stampings, Wire Forms—in any quantity, any material, for every mechanical application.

Send in your inquiry, drawings or samples. Get Hubbard's suggestions and quotations on the particular parts you need.

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**EXPANSION
PLUGS**

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PARKER-KALON
Cold-forged Products

PRODUCTS of an improved process, Parker-Kalon Cold-forged Socket Screws, Wing Nuts, Cap Nuts and Thumb Screws are stronger . . . more accurate and uniform . . . more pleasing in design. That's why these products have won such wide-spread acceptance among men who design and men who assemble products. Free samples & prices on request.

PARKER-KALON CORPORATION
200-202 Varick St., New York, N. Y.



PARKER-KALON
Cold-forged
SOCKET SCREWS WING NUTS
CAP NUTS THUMB SCREWS

SOLD ONLY THROUGH REPUTABLE DISTRIBUTORS



STEEL IN SAILING SHIPS: Great Britain's shortage of ships to haul war materials from the U. S., "arsenal of democracy," may force into service ships like this, the Swedish bark, Abraham Rydberg, which recently completed a 69-day voyage from Santos, Brazil, to Boston.

Milwaukee Begins Training Program

• • • In order to assist Wisconsin small industries train defense workers, a committee headed by Kenneth Ode of the Falk Corp. has been set up under the general direction of Sidney Hillman, co-chairman of the national defense program at Washington. By co-operating with owners of small factories the committee expects to increase the number of skilled workers. Ode has named in his committee George Havlista, Kearney & Trecker Corp.; Albert Pfeiffer, Harnischfeger Corp. and Arnold Nielsen, Wisconsin Electric Power Co.

December Steel Imports 4016 Tons

At the highest level since June, imports of iron and steel products (except scrap) totaled 4016 gross tons valued at \$206,825 in December, according to the Bureau of Foreign and Domestic Commerce. This is in direct contrast with the November trade of 728 tons valued at \$165,009—the smallest quantity imported since World War days—but is small in comparison with the trade of December, 1939—13,442 tons valued at \$1,099,177. December's showing is almost solely the result of the importation of 3,692 tons of spiegeleisen from Canada.

Plant Modernization Called Aid to Defense

• • • "Plant modernization offers an attractive opportunity to lighten the pressure on the labor market, to reduce costs and above all to maximize production per man-hour and man-year and make industry's contribution to defense one of the highest order," according to a booklet, "Meeting the Demand for Faster Production," recently published by Farrel-Birmingham Co., Inc., machinery manufacturers of Ansonia, Conn. According to the estimates of the authors, our wartime production needs, as measured in terms of man-hours of factory labor, must be revised upward in the light of developments abroad.

Wright Opens Machinists' School in Armco Building

• • • Wright Aeronautical Corp. has opened a training school for machinists in Middletown, Ohio, in a building provided by the American Rolling Mill Co., Charles R. Hook, Armco president, reports. Several hundred men will be trained in this school. After a training period of from two to three months, those who complete their training satisfactorily will be eligible for positions in the new airplane engine plant now under construction at Lockland, Ohio, within commuting distance of Middletown. Men to take the defense production training are being selected by aircraft engine company employment officials from a group of employees on the Armco payrolls made available by changes in manufacturing processes.

Setting Up of Priorities On Engineers Suggested

• • • Declaring that the shortage of engineers is becoming the major bottleneck in the whole defense program, Dr. Harvey Nathaniel Davis, president, Stevens Institute of Technology, advocates establishment of priorities in men as well as in materials in the production program, and deferring the draft into combat service of trained men more urgently needed in industry.



*One of the many
reasons why..*

American
LOCOMOTIVE CRANES

Gasoline and Diesel

ARE ABLE TO SHOW A CONSISTENTLY HIGH DAILY OUTPUT

Large, outside contracting band clutches operated through AMERICAN graduated air controls permit smooth, almost effortless application of the frictions. Ease of operation prevents operator fatigue and explains the uniformly high output of the new AMERICAN Locomotive Cranes.

FOUR MODELS 25 to 45 tons

Do something about it right now. WRITE FOR A COPY OF CATALOG NO. 600-L-2

AMERICAN HOIST & DERRICK CO. <small>NEW YORK SAINT PAUL, MINNESOTA CHICAGO</small>		 CROSBY CLIP <small>FASTENS WIRE ROPE <i>Safely</i></small>
<small>AMERICAN TERRY DERRICK CO. SOUTH KENNY, N. J.</small>		

AFTER 1,000 HOURS! RACK-INSULATING COATING STILL GOOD

**UNICHROME*
RACK COATING-W**

SHOWS STRIKING RESULTS

**"Have 100 Racks Coated—
200 on Order"**

WRITES DELIGHTED USER

FEB. 20—Reports of interest to platers everywhere continue to come from users of United Chromium's "Unichrome" Rack-Coating-W, regarding the remarkable properties of this rack-insulating material. One of these users connected with a prominent plant is especially enthusiastic. He reports . . . "Have had a thousand hours' constant use of racks coated with Unichrome* Rack-Coating-W—through cleaners at 180°F. to 212°F., and cobalt-nickel solution at 155°F., and then through chromium plating solutions." Another user says . . . "After 11 months' use your Unichrome* Rack-Coating-W is still standing up fine in both the bright nickel and chromium solutions."

Enthusiastic approval of Unichrome* Rack-Coating-W by platers is attributed to its unique combinations of advantages. These are:

1. Withstands boiling cleaners and all plating solutions.
2. Tough—withstands wear and tear of handling.
3. Contains no ingredients harmful to plating solutions.
4. Cuts costs—reduces frequency of re-coatings.
5. Easy to apply—"dip and force dry" method.
6. Light in color—easy to see how well the rack is covered.
7. Any part of rack can be recoated without recoating entire rack.

Write for Bulletin 15
Containing Complete Information

Platers without rack-coating facilities may have their racks coated with "Unichrome" Rack-Coating-W by Chromium Corporation of America, 4645 West Chicago Avenue, Chicago, Ill.; Belke Manufacturing Company, 947 North Cicero Avenue, Chicago, Ill.; or United Chromium, Incorporated, Waterbury, Conn.

**UNITED CHROMIUM
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*Trade Mark
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Scrap Exports Turn Down In December

••• Exports of scrap from the United States were down in December and in the 1940 calendar year, figures released by the Metals and Minerals Division of the Bureau of Foreign and Domestic Commerce reveal. Shipments in December totaled 69,980 gross tons valued at \$1,293,579 in contrast with the 74,349 tons valued at \$1,303,814 exported in November and with the 206,402 tons valued at \$4,064,358 dispatched in December, 1939.

Figures for the respective calendar years 1939 and 1940 present a similar picture. In the earlier year this trade had amounted to 3,577,427 tons valued at \$55,810,417 whereas in the latter the totals had been 2,823,088 tons valued at \$48,350,886. A comparison of shipments in the two years to principal foreign scrap markets follows:

Market	Gross Tons	
	1940	1939
United Kingdom	969,425	508,293
Japan	963,519	2,026,854
Canada	380,883	175,496
Italy	320,923	425,896
Sweden	53,277	22,715

The calendar year figures also may be broken down so as to indicate the quantities of the several scrap materials included as follows:

Commodity	Gross Tons	
	1940	1939
Iron and steel scrap	2,793,718	3,551,589
Tin plate scrap	3,536	10,154
Tin plate circles, etc.	4,590	6,552
Waste-waste tin plate	6,091	9,132
Terne plate scrap*	15,153	*

(*First distinguished separately in 1940.)

Returning to the December scrap trade, included in the 69,980-ton total was 68,135 tons of iron and steel scrap of which the United Kingdom took 55,290 tons, Canada, 9,933 tons, and Mexico 2,522 tons. All of the 670 tons of tin plate

scrap exported went to Japan, but the 621 tons of tin plate circles, cobbles, etc., shipped in December reached a number of markets including China, 440 tons; Egypt, 100 tons, and Japan, 52 tons. The 503 tons of waste-waste tin plate exported went principally to Hong Kong, 235 tons; China, 183 tons, and Thailand, 62 tons, while China took the entire 51 tons of terne plate scrap exported.

SAE President To Speak On Defense Engineering

••• A. T. Colwell, president of the Society of Automotive Engineers and vice-president of Thompson Products, Inc., Cleveland, will address Detroit members of the SAE at an "off-the-record" session on Feb. 24 at Hotel Statler. His subject "Behind the Scenes in National Defense Engineering" will present material gathered in his last three trips to Europe, giving some confidential information concerning developments in engineering for national defense.

Mr. Colwell's talk will cover in a general way the methods used by Germany to develop her air force with special reference to the aircraft engine development which permitted the Germans to start from scratch and in six years surpass the entire world in production.

The defense session will follow a dinner at 7:00 P.M. As "coffee speaker" John Haien, director of the "Department of Tomorrow," Chrysler Corp. and the organizer of the industrial training program for the National Youth Administration, will precede Colwell's appearance.

A NEW IRON ORE UNLOADER has been installed on the docks at Bethlehem Steel Co.'s Lackawanna plant. It is a 17-ton Wellman (Hulett Type) with stocking conveyor, built by Wellman Engineering Co., Cleveland.





TWENTY-NINE-YEAR-OLD Jesse E. Hobson, who once aspired to be a teacher and "never did have any desire to tinker with radio sets or a home workshop," has just received the Eta Kappa Nu award as the country's outstanding young electrical engineer for the year 1940. A member of Westinghouse's engineering staff in East Pittsburgh, Pa., Dr. Hobson received the annual award at a dinner in conjunction with the AIEE winter convention in Philadelphia. Eta Kappa Nu is an honorary electrical engineering society affiliated with the AIEE.

Republic's '40 Shipments Total 4,198,919 Tons

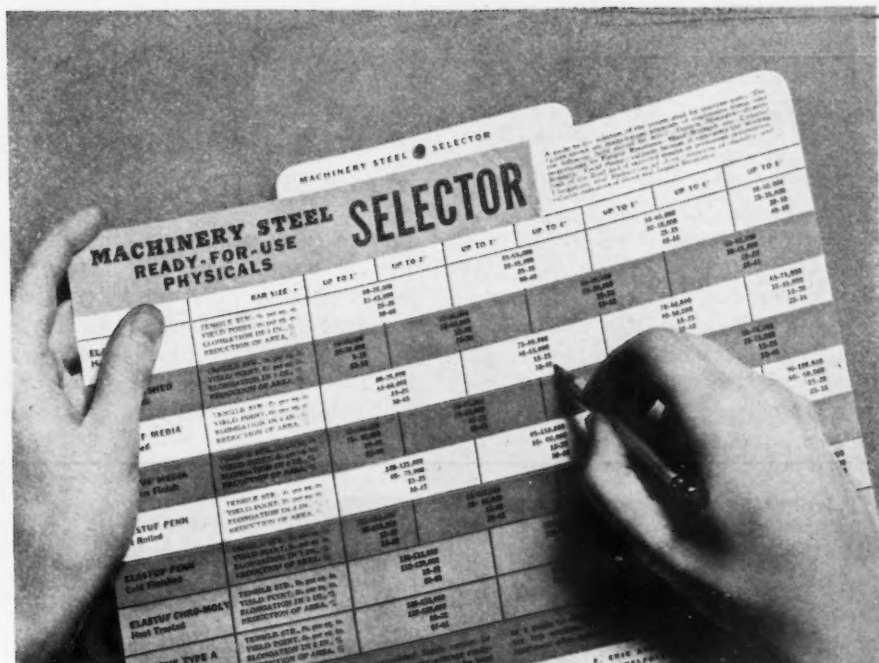
Cleveland

• • • Operating data just compiled by Republic Steel Corp. show sharp gains for 1940 as compared to other recent years.

Ingot production was 6,111,678 net tons, against 4,817,867 tons in 1939; steel shipments were 4,198,919 net tons against 3,312,784 tons in 1939. Ingot production was 78 per cent of capacity, compared with 66.2 per cent in 1939, 63.2 per cent in 1937 and 70.9 per cent in 1936.

The corporation mined 4,266,868 net tons of iron ore in 1940 and purchased 4,510,285 tons. The amount of coal mined was 4,523,077 tons. Coke production was 4,093,819 tons. Pig iron production was 4,210,042 tons and pig iron shipments were 943,916 tons.

The average monthly number of employees in 1940 was 56,489; total payroll was \$100,074,202; average hours worked per week per employee was 36.9 hr.; average hourly earnings are 91.9c.



"That's the Steel I Want—"

It's easy to understand why practical steel men consider this Machinery Steel Selector one of their most useful tools. It enables you to pick your steel in terms of the job to be done, instead of trying to project physicals from a chemical analysis from a piece made from a small diameter. It presents the picture of ELASTUF Steels in ready-for-use physicals, eliminating uncertainties. And it involves only two simple steps.

First check your design for the size and strength of the steel you need and conditions to be met. Then, check your Selector for the ELASTUF Steel meeting these requirements in the right diameter. Machine—and put to work.

7 OTHER REASONS THAT RECOMMEND ELASTUF STEELS TO YOU.

1. Proven performance.
2. Known physicals.
3. Machinable in ready-for-use condition, eliminating extra heat treatment.
4. A single related group covering most all machinery steel uses.
5. Consistent uniformity through controlled production.
6. No premium in cost.
7. Always available at nearby points.

That's how simple it is when you use your Selector. That's how steel specifiers are saving time and eliminating second guesses, these days, when speed is at a premium. Make sure all your draftsmen, shop foremen and engineers have a copy. Supplied free upon request from the nearest ELASTUF warehouse distributor listed below.

ELASTUF STEELS



BEALS-McCARTHY & ROGERS • BUFFALO-ROCHESTER
BROWN-WALES CO. • BOSTON, MASS. - LEWISTON, ME.
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**Selector
Ends Guesswork**
By giving steel data in terms of ready-for-use physicals, the Machinery Steel Selector enables you to pick the right steel in any size up to 8" without guesswork. Use your Selector—for another one, write the nearest point listed below.

On The Assembly Line

(CONCLUDED FROM PAGE 58)

part of an inspired effort to provide the 150,000 trained men (at least) who will be required on defense jobs within the automobile industry by the latter part of 1941. How many more will be required no one knows. However, the Auto-

motive Committee for Air Defense has estimated that 858,000 man-hours of labor daily will be required to supply the parts and sub-assemblies for 15 bombing planes a day. On the basis of an 8-hr. day this will require 107,250 men, or about

one-quarter of the total employment in the motor car industry today. Moreover, the 15-a-day schedule probably will be doubled, it has been stated officially. That indicates a requirement for 214,500 men. In addition, there are many non-aviation defense projects underway and scheduled for the automobile industry, so it is not unreasonable to foresee a need for 300,000 defense workers in this area by the end of this year or early next year.

Twenty thousand square feet of floor space has been set aside by Ford in the new airplane engine building to be used as an aircraft apprentice school. Already the volume of applicants for training is so great, according to F. E. Searle, superintendent of Ford schools, that only one of every 40 can be accepted. Several hundred have already qualified for admission, although the building is not yet completed. The quota of 2000 high school graduates between 18 and 19 years of age will be filled before next June.


According to Searle, the preliminary training program and the schedule to be followed in the new school will be aimed at inculcating the idea that in aircraft work almost every surface must be super-smooth. Boys now enrolled are starting in the present Ford Trade School on a three months' preliminary course.

Demand for text books used in the Ford apprentice school system is so great that the school print shop turned out 50,000 copies of various texts in 1940, compared with an ordinary output of around 20,000 a year. Schools throughout the country and abroad, expanding their vocational training courses to meet defense needs, have ordered the apprentice books on such subjects as mechanical drawing, shop theory, mathematics and the sciences. A recent day's mail brought orders from 22 states, including a request from the War Department.

Auto Output High

Automobile production continues at the high level set a week ago when assemblies reached a total of 127,675. Output for the week ended Feb. 14 was 127,500 compared with 95,050 in the corresponding week of last year, according to Ward's Automotive Reports.

TRAMRAIL SERVES EVERY PRESS
at United States Register Company



75% Reduction
in Time for Die Changes
No handling accidents
since installed

*Boxes of materials are easily
picked up and transported.*

*Courtesy United
States Register Co.,
Battle Creek, Mich.*

An inexpensive, easily-installed, hand-propelled Cleveland Tramrail system interconnects all presses with each other and also connects each with the die storage and machine shop. All but 18 small presses are served this way.

Twelve hand hoists are used in making die changes and servicing the presses with raw stock. Dies up to one ton are

handled without difficulty and with 75% reduction in time over hoists formerly used.

No accidents in the handling of dies and materials have occurred since this system was installed nearly 3 years ago.

Write for Booklet 2004-A. Gives clear, concise understanding of materials handling. Highly illustrated.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1115 East 283rd St. Wickliffe, Ohio



CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT
Other products: CLEVELAND CRANES and STEELWELD MACHINERY

Government Awards

Ordnance Dept.:

Adirondack Foundries & Steel Co., Inc., Watervliet, N. Y.; castings	1,055
Advance Pressure Castings, Inc., Brooklyn; artillery ammunition components	\$10,925
Air Reduction Sales Co., New York; electrodes	1,260
Ajax Electrothermic Corp., Trenton, N. J.; crucibles	1,522
Aluminum Co. of America, Pittsburgh; aluminum	7,389
Aluminum Co. of America, Pittsburgh; aluminum alloy	4,170
aluminum strip	3,999
American Smelting & Refining Co., Cambridge, Mass.; weights	1,440
American Brake Shoe & Foundry Co., Detroit; hand guards	6,000
American Brass Co., Waterbury, Conn.; gilding metal	47,500
brass	17,434
American Foundry Equipment Co., Mishawake, Ind.; machines, blasting	5,550
American Generator & Arm Co., Chicago; generators	22,000
American Hair & Felt Co., Chicago; artillery ammunition components	2,397
American Steel & Wire Co. of New Jersey, Philadelphia; nails	1,061
Apex Tool & Cutter Co., Inc., Shelton, Conn.; cutters	3,394
Apex Tool & Cutter Co., Inc., Shelton, Conn.; cutters	9,150
Armstrong Mfgs. Supplies, Inc., Pittsburgh; wrenches	3,674
kerosene lanterns	4,251
Ashton Valve Co., Cambridge, Mass.; air pressure gages	6,830
Atlas Powder Co., Horrell, Pa.; artillery ammunition components	11,000
Automatic Die & Products Co., Cleveland; tools	1,098
Baltimore Brass Co., Baltimore; metal strips	6,359
Barber-Colman Co., Rockford, Ill.; cutters	1,291
Bearings Co. of America, Lancaster, Pa.; ball bearings	6,119
Belknap Hardware & Mfg. Co., Louisville, Ky.; hardware	1,476
Belmont Smelting & Refining Works, Inc., Brooklyn; ingots, copper	6,620
Bendix Aviation Corp., Bendix Products Division, South Bend, Ind.; carburetors and assemblies	6,436
Bendix Aviation Corp., Eclipse Aviation Div., Bendix, N. J.; generators	222,852
E. W. Bliss Co., Brooklyn; presses	25,115
E. W. Bliss Co., Brooklyn; punch presses	1,900
Bodine Machine Co., Bridgeport, Conn.; plates for drilling machine	1,335
drilling and tapping machine...	1,250
Bohn Aluminum & Brass Corp.; castings	19,740
Braeburn Alloy Steel Corp., Braeburn, Pa.; steel	2,195
Bridgeport Rolling Mills Co., Bridgeport, Conn.; brass	102,852
Bristol Brass Corp., Bristol, Conn.; artillery ammunition components	7,840
Brown & Sharpe Mfg. Co., Philadelphia; machines, hand screw	3,508
Brown & Sharpe Mfg. Co., Providence; steel parallels	4,708
tools	5,445
gages	1,330
Buda Co., Chicago; jacks	1,867
Budd Wheel Co., Detroit; assemblies	4,018

Building Products Co., Davenport, Iowa; trucks	1,250
Canister Co., Phillipsburg, N. J.; machine, varnishing	2,202
Carbide & Carbon Chemicals Corp., South Charleston, W. Va.; artillery ammunition components	3,960
Carboloy Co., Inc., Philadelphia; tools	4,051
Carnegie-Illinois Steel Corp., Boston; steel	1,735

Chambersburg Engineering Co., Chambersburg, Pa.; parts for Chambersburg hammers	2,320
Chase Brass & Copper Co., New York; brass	1,561
Chase Brass & Copper Co., Waterbury, Conn.; brass strip	112,582
seamless metal	12,024
Chase, Parker & Co., Inc., Boston; chain slings	2,549
tools	1,440
Chicago Tramrail Co., Chicago; tramrails	1,510
Cincinnati Milling & Cincinnati Grinders, Inc., Cincinnati; gears	1,249
Clayton & Lambert Mfg. Co., Detroit; gasoline torches	1,083

Three Times Branded ...FOR YOUR PROTECTION

• Good things rarely change. The practice of placing three triangles diagonally across every sheet of galvanized ARMCO Ingot Iron has been justified by years of usage.

No matter how these sheets are cut, all or part of at least one triangle will show. This is your protection, whether you use galvanized ARMCO Ingot Iron for maintenance or manufacturing.

If your products are galvanized, your customers will be glad to see this familiar trademark. Many of them have learned from experience, or from ARMCO's 27 years of national advertising, that this symbol stands for utmost durability.

In the shop, you'll find every sheet is alike... alike in workability, high refinement and uniform weight of coating. Use galvanized ARMCO Ingot Iron or ARMCO Ingot Iron PAINTGRIP for work to be painted. And remember



the triangle trademark is your assurance of long, trouble-free service. Write The American Rolling Mill Company, 940 Curtis Street, Middletown, O.

Galvanized ARMCO INGOT IRON

GOVERNMENT AWARDS

Clemson Brothers, Inc., Wash- ington; blades, hack saw	1,988
Cleveland Tool Engineering Co., Cleveland; machines, grinding..	1,256
Cleveland Tool Engineering Co., Cleveland; grinders	1,257
Cleveland Twist Drill Co., Cleve- land; reamers and drills	3,343
Cleveland Twist Drill, Cleveland; reamers	1,788
Colt's Patent Fire Arms Mfg. Co., Hartford; small arms materiel..	18,335
machinery	2,697
Columbia Steel & Shafting Co., Carnegie, Pa.; steel bars	18,259

Consolidated Packaging Machinery Corp., Buffalo; scale	1,375
Consolidated Steel Warehouse Co., Philadelphia; iron strapping ..	1,742
Continental Motors Corp., Muske- gon, Mich.; assemblies	2,736
C. Cowles & Co., New Haven, Conn.; small arms materiel ...	1,324
Crucible Steel Co. of America, New York; steel	5,398
tool steel	2,519
Cutter, Wood & Sanderson Co., Cambridge, Mass.; tools	8,557
Davenport Machine Tool Co., Inc., Rochester, N. Y.; machinery..	1,889

DeLisser Machine & Tool Corp., New York; gages	2,120
DeLisser Machine & Tool Corp., New York; tools	2,787
Denman & Davis, Pittsburgh; steel bars	3,766
Detroit Broach Co., Inc., Detroit; broach sections	57,801
Diecasters, Inc., Ridgefield, N. J.; die castings	11,894
Drive-All Mfg. Co., Detroit; mo- torizing units	1,794
E. I. du Pont de Nemours & Co., Wilmington, Del.; powder	1,181
Electric Boat Co., New York; elec- tric motors	4,152
Electric Wheel Co., Quincy, Ill.; trailers	4,293
Elgin National Watch Co., Elgin, Ill.; watches	54,529
Exact Weight Scale Co., Columbus, Ohio; scales	25,290
Ex-Cell-O Corp., Continental Tool Works Div., Detroit; cutters ...	1,271
Federal Screw Works, Detroit; artillery ammunition components	232,725
Felt & Tarrant Co., Boston; comp- tometers	1,700
Charles Fischer Spring Co., Brook- lyn; springs	3,850
Fox Munitions Co., Philadelphia; gages	1,342
General Electric Co., Schenectady; ammeters, portable	1,938
General Electric Supply Corp., Schenectady; fixtures, lighting.	1,097
Globe Forge & Foundries, Inc., Syracuse, N. Y.; forgings	2,612
Great Southern Box Co., Inc., New Orleans; wire boxes	1,075
Greenfield Tap & Die Corp., Greenfield, Mass.; gages	3,309
taps	1,065
Haarmann Steel Co., Holyoke, Mass.; steel beams	1,900
Hadley Special Tool Co., Inc., Bos- ton; tools	7,200
Hanson-Whitney Machine Co., Hartford; gages	8,055
Hardinge Co., York, Pa.; dryers, rotary	8,774
A. C. Harvey Co., Allston, Mass.; deformed steel	1,414
Henry & Wright Mfg. Co., Hart- ford; machines	5,754
International Harvester Co., Chi- cago; engines	1,523
International Nickel Co., Inc., Huntington, W. Va.; nickel al- loy	42,238
Justus Johnson & Son Co., Hart- ford; dies	3,135
Jones & Lamson Machine Co., Springfield, Vt.; machines	17,023
machines, grinding	15,946
John P. Kelly, Philadelphia; cast- ings, brass	1,299
Kennedy Van Saun Mfg. & Engi- neering Corp., Danville, Pa.; ar- tillery materiel	12,067
Kent Machine Co., Grand Rapids, Mich.; machines	3,260
King Powder Co., Cincinnati; ar- tillery ammunition components.	29,361
Landis Machine Co., Waynesboro, Pa.; machines	1,504
LaSalle Steel Co., Hammond, Ind.; steel	3,994
Lincoln Park Tool & Gage Co., Lincoln Park, Mich.; gages ...	1,752
Lincoln Tool & Die Co., Inc., De- troit; milling fixtures	1,467
Lowell Wrench Co., Worcester, Mass.; wrenches	22,308
Lufkin Rule Co., Saginaw, Mich.; scales	4,224
Lukens Steel Co., Coatesville, Pa.; steel plates	16,703
Lukenweld, Inc., Coatesville, Pa.; drop forgings	4,202
Marshall & Huschart Machinery Co., Chicago; milling machines.	1,031

SPEED CASE & STEEL

A LOW CARBON OPEN HEARTH PRODUCT

Assures You...

1. INCREASE PRODUCTION

40% to 80% Over SAE X1020 - X1314, etc.

2. MACHINABILITY

Machines as fast as SAE X1112

3. CARBURIZING

Carburizes like SAE X1020

4. PHYSICAL PROPERTIES

Equal to SAE X1020 - X1315 - 1115

5. UNUSUAL DUCTILITY

180° Bend (Cold Drawn)

6. SMALLER INVENTORY

Due to Versatility of Speed Case

• SPEED CASE

A low carbon, open
hearth case carburizing
steel of unusual ductility.
Physical properties high.
Shock value excellent.
Cold drawn - 70 to
85,000 P. S. I. Tensile -
60 to 75,000 yield - 17%
to 22% Elongation - 52%
to 60% Reduction of area.

MONARCH STEEL COMPANY

HAMMOND • INDIANAPOLIS • CHICAGO
PECKOVER'S LTD., Toronto, Canadian Distributor

THE FITZSIMONS COMPANY

YOUNGSTOWN, OHIO

MANUFACTURERS OF COLD DRAWN CARBON AND ALLOY STEEL BARS

GOVERNMENT AWARDS

Mercury Mfg. Co., Chicago; tractors	1,135
Metalwash Machinery Co., Inc., Newark; equipment, washing ..	5,970
Modern Bond Corp., Wilmington, Del.; small arms material	12,330
Modern Tool & Die Co., Philadelphia; gages	37,502
Morse Twist Drill & Machine Co., New Bedford, Mass.; reamers ..	1,080
Morton Mfg. Co., Chicago; chests, ammunition	321,079
Mueller Brass Co., Port Huron, Mich.; artillery ammunition components	113,660
Murray Mfg. Corp., Brooklyn; artillery ammunition components ..	142,680
National Acme Co., Cleveland; machine, screw	9,959
National Cash Register Co., Dayton, Ohio; artillery ammunition components	10,490
..... dies	1,600
National Lock Washer Co., Newark; artillery ammunition components	44,752
National Mineral Co., Chicago; small arms material	6,029
National Tube Co., Christy Park, McKeesport, Pa.; ammunition components	91,000
National Twist Drill & Tool Co., Detroit; drills	1,370
George P. Nichols & Brothers, Inc., Chicago; machinery	14,710
Niles-Bement-Pond Co., Pratt & Whitney Division, West Hartford; gages	16,568
..... drills	3,765
..... taps	1,181
Otis Elevator Co., Buffalo; steel castings	1,157
Pangborn Corp., Hagerstown, Md.; steel	2,150
Parent Metal Products, Inc., Philadelphia; steel shelving	1,108
..... trays, stacking	3,702
Poor & Co., Canton Forge & Axle Works, Canton, Ohio; forgings ..	11,230
Precise Tool & Mfg. Co., Farmington, Mich.; gages	10,057
Precision Mfg. Co., Philadelphia; gages	9,928
Henry Prentiss & Co., Inc., New York; machines, drilling	2,655
S. E. & R. C. Proctor, Boston; tools & equipment	1,049
A. B. & J. Rathbone, Palmer, Mass.; cold drawn steel	9,914
Reed Prentice Corp., Worcester; machines, routing	22,352
Roesler Machine Co., Elkins Park, Pa.; tools	6,816
Rustless Iron & Steel Co., Baltimore; steel	2,532
George Sall Metals Co., Massena, N. Y.; aluminum strips	1,535
George T. Schmidt, Inc., Chicago; machines, marking	2,890
Service Caster & Truck Co. of New England, Somerville, Mass.; trucks, lift	2,146
Sheffield Gage Corp., Dayton, Ohio; gages	2,626
W. E. Shipley Machinery Co., Philadelphia; grinders	198,956
Sieg Co., Davenport, Iowa; hardware and reamers	5,046
Simmonds Saw & Steel Co., Chicago; steel	1,280
Sinclair Refining Co., New York; oil, cutting	2,376
SKF Industries, Inc., Philadelphia; ball bearings	4,927
Smith, Drum & Co., Philadelphia; machines, washing	2,029
Smithe Machine Co., Inc., New York; machines, spinning	51,620
Standard Gage Co., Inc., Poughkeepsie, N. Y.; gages	11,176
Standard Pressed Steel Co., Jenkintown, Pa.; artillery ammunition components	142,690

Star Machine & Tool Co., Cleveland; gages	4,367
Sterling Products Co., Inc., Moline, Ill.; lighting units	2,428
Stevens Walden, Inc., Worcester, Mass.; small arms material ..	3,274
Taft-Peirce Mfg. Co., Woonsocket, R. I.; gages	5,701
Talon, Inc., Meadville, Pa.; gages ..	27,349
Taylor-Wharton Iron & Steel Co., Easton, Pa.; artillery material ..	10,428
Titeflex Metal Hose Co., Newark; conduit	7,790
Triumph Explosives, Inc., Elkton, Md.; artillery ammunition components	202,950

Trojan Hardware Co., Troy, N. Y.; gas burning equipment	8,578
Nathan Trotter, Inc., Philadelphia; tin	4,040
United States Motors Corp., Oshkosh, Wis.; parts for generating units	1,214
Veit & Young, Philadelphia; tools ..	16,707
Vinco Corp., Detroit; gages	11,135
Jervis B. Webb Co., Philadelphia; conveyor, trolley type	9,197
Weldon Tool Co., Cleveland; cutters	1,132
Westinghouse Electric & Mfg. Co., Philadelphia; motors	1,575



**Here's how I
boosted their
output 50%!**

—THE ROTOR ANALYST

They were short of air. This foundry was thinking about adding more air tools to get *faster production*. Lucky they called me in. Here's what I found: Their two air compressors were overtaxed. Tools weren't turning at top efficiency. An additional compressor to provide the necessary air would have cost \$2,622 and would have required space they didn't have.



This foundry was short of air. Rotor High-Cycle Tools increased piece output 50%.

Analysis. All signs pointed to high-cycle tools. A high-cycle m.g. set would cost about \$937—64% less than a compressor. It could be installed on a wall bracket—out of the way. Maintenance would be less. Cost of high-cycle power would be one-fourth that of air. Delivery of high-cycle equipment could be made quicker.

Result. We installed Rotor High-Cycle Grinders. *Boosted their piece output 50%* with three less High-Cycle tools than Air tools. The same number of men now get fatter pay. Wheel life has been lengthened because speeds are more constant. Power costs are 75% less. Operation is quiet and clean.

Air or High-Cycle? ... I'm unbiased. I'd be glad to make a similar study to improve *your* portable tool operations. No obligation, of course. **THE ROTOR ANALYST**

AIR

THE **ROTOR TOOL** CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

HIGH CYCLE

GOVERNMENT AWARDS

Wiedemann Machine Co., Philadel- phia; gages	2,781
Andrew Wilson Co., Lawrence, Mass.; steel shelving	1,129
Wyoming Tool & Die Co., Phila- delphia; gages	29,880
Zimmerman Steel Co., Bettendorf, Iowa; steel castings	1,860

Medical Dept.:

Superior Sleeprite Corp., Chicago; steel beds	\$33,912
steel desk chairs	11,141
steel dressers and night tables..	73,937
A. J. Ulmer, New York; metal boxes	2,255
S. S. White Dental Mfg. Co., New York; dental lathes	1,536

Corps of Engineers:

Addressograph - Multigraph Corp., Washington; duplicating ma- chines and attachments	7,943
Atlas Press Co., Kalamazoo, Mich.; bench shapers	2,389
Austin-Western Road Machinery Co., Aurora, Ill.; graders	10,420
Charles Bruning Co., Inc., New York; drafting machines	3,512
surveying equipment	3,147
Charles H. Bruning Co., Washing- ton; surveying equipment	\$3,807
Bucyrus-Erie Co., South Milwau- kee; well drilling machines	9,015
Eugene Dietzgen Co., Washington; surveying equipment	1,399

Davenport Besler Corp., Daven- port, Iowa; locomotives	125,250
Emerson Electric Mfg. Co., St. Louis; ceiling fans	1,362
Fate-Root-Heath Co., Plymouth, Ohio; locomotives	125,250
General Fireproofing Co., Wash- ington; metal office chairs	3,152
Harter Corp., Washington; metal stools	1,064
Ingersoll-Rand Co., New York; boring machines	4,828
International Stacey Corp., Colum- bus, Ohio; searchlight towers and searchlights	12,892
Lufkin Rule Co., New York; steel tapes	6,050
National Carbide Corp., New York; floodlights and carbide	1,047
Paving Supply & Equipment Co., Washington; graders	1,950
Remington-Rand, Inc., Washing- ton; portable typewriters	178
Underwood Elliott Fisher Co., Washington; typewriters	1,212
Woodings-Verona Tools Works, Verona, Pa.; bars	19,528
Zarkin Machine Co., Inc., New York; plate grainers	5,190

Signal Corps:

Peter A-Petroff, New York; stake crank extensions	\$9,034
Harvard Lock Co., New York; mountings	20,120
Jackson Electrical Instrument Co., Dayton, Ohio; test oscillator & spare parts	24,366
Utica Drop Forge & Tool Corp., Utica, N. Y.; pliers	30,088

Air Corps:

Bendix Aviation Corp., Pioneer Instrument Div., Bendix, N. J.; assys.	\$492,050
Bendix Aviation Corp., Bendix Products Div., South Bend, Ind.; strut & axle assys.	159,070
Continental Machines, Inc., Minne- apolis; machines	207,765
Crouse-Hinds Co., Syracuse, N. Y.; lamp assys.	26,586
Curtiss-Wright Corp., Curtiss Pro- peller Div., Clifton, N. J.; pro- peller assys.	182,655
parts for Curtiss propellers ...	272,231
Greenfield Tap & Die Corp., Green- field, Mass.; dies & taps	68,712
Holtzer-Cabot Electric Co., Boston; inverters	198,000
King-Seeley Corp., Ann Arbor, Mich.; eliminators & valves ...	101,660
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.; assys.	57,500
Sperry Gyroscope Co., Inc., Brook- lyn; indicator & controller assys.	120,420
Union Twist Drill Co., Athol, Mass.; twist drills	32,546

Coast Artillery Corps:

National Telephone Supply Co., Cleveland; tools, crimping and sleeves	\$718
Wright Aeronautical Corp., Pater- son, N. J.; aeronautical engines	67,931

Quartermaster Corps:

Alan-Lawrence Co., Inc., New York; water mains	\$3,100
Allen Boat Co., Cretna, La.; all steel boats	204,500
James J. Burke Co., Salt Lake City; 8 underground magazines	62,900
Calumet Shipyard & Drydock Co., Chicago; all steel boats	212,000
Cyclone Fence Co., Cleveland; magazine area fence	1,940
Dubuque Boat & Boiler Works, Dubuque, Iowa; all steel boats..	265,000
Niels Fugal, Pleasant Grove, Utah; water lines	52,517

YOUR POSITIONED WELDING WILL GO EVEN FASTER with Murex TYPE FHP

THE HIGH SPEED ELECTRODE FOR
DOWNHAND FILLETS, DEEP GROVE
WELDING AND COVER BEADS

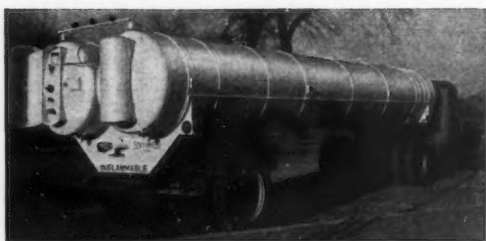
Easy to use at high amperages, with either A.C. or D.C. current, this recently developed electrode assures more rapid, more economical welding. Its slag is readily controlled and removes freely so that cleaning time is cut to a minimum and costs are reduced appreciably on heavy work where multi-layer welding is required. At the same time, little spatter is produced, weld surfaces are exceptionally smooth, and neat and good-looking concave fillets and cover beads are the result.

Write for full particulars and ask to have a Murex engineer call and show you what Type FHP can do on your production welding.

METAL & THERMIT CORPORATION, 120 Broadway, New York, N. Y.

Albany • Chicago • Pittsburgh • So. San Francisco • Toronto

"Murex Electrodes—Thermit Welding—Thermit Metals & Alloys."

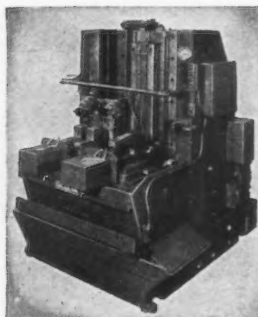


Welders qualify readily with Type FHP for code welded work like this butane tank, made by Southwest Factory, Oklahoma City.

Oilgear Company, Milwaukee, builds well-designed, machines; wants clean, neat welds like Type FHP assures.



Type FHP welds stand the gaff in these stripping tongs made by Shaw-Box Crane & Hoist Co.



HEAVY COATED

Electrodes

A COMPLETE LINE FOR EVERY WELDING APPLICATION



Investigate Thermit Welding, too—in use since 1902 for heavy repair work, crankshafts, etc.

GOVERNMENT AWARDS

Luders Marine Const. Co., Stamford, Conn.; all steel boats	306,960
S. B. Slack, Decatur, Ga.; water transmission line and appurtenances	58,994
Spedden Shipbuilding Co., Inc., Baltimore; all steel boats	267,500
Sturgeon Bay Shipbuilding & Drydock Co., Sturgeon Bay, Wis.; all steel boats	214,000
Yellow Truck & Coach Mfg. Corp., Detroit; trucks, 1½ ton	124,838

Chemical Warfare Service:

Acusnet Process Co., New Bedford, Mass.; faceblanks	\$1,425
American Laundry Machine Co., Cincinnati; drying tumblers	3,111
Anderson & Ireland Co., Baltimore; hardware	767
Barcalo Mfg. Co., New York; pliers	701
Beach Russ Co., New York; pumps vacuum	1,386
E. W. Bliss Co., Brooklyn; parts, press	1,903
Charles T. Brandt Brothers, Baltimore; welded steel channels	1,296
Chase Brass & Copper Co., Inc., Waterbury, Conn.; brass	2,960
Continental Can Co., Inc., New York; canister parts	51,611
F. A. Davis & Sons, Baltimore; machines, ice making	1,492
E. I. du Pont de Nemours & Co., Wilmington, Del.; detonators, electric	3,055
Eastern Malleable Iron Co., Wilmington, Del.; rings, handling	1,455
Federal Tin Co., Inc., Baltimore; tinplate	2,520
Charles Fischer Spring Co., Brooklyn; clamps, wire, steel	4,900
Gries Reproducer Corp., New York; valve testing apparatus	470
Hunter Pressed Steel Co., Lansdale, Pa.; clamps, wire, steel	10,685
MacLane Hardware Co., New York; shears and pliers	4,885
Manning, Maxwell & Moore, Inc., New York; screw drivers	934
Manufacturers' Supply Co., Washington; exhaustor units	5,220
Miller Co., Meriden, Conn.; brass	12,017
Miller Co., Meriden, Conn.; brass	8,122
Pressed Steel Tank Co., West Allis, Wis.; containers, shipping	14,320
Proctor & Schwartz, Inc., Philadelphia; machines, screw type closing	24,060
Raymond Mfg. Co., Corry, Pa.; clamps, wire, steel	3,745
Revere Copper & Brass, Inc., Baltimore Division, Baltimore; brass	1,121
Revere Brass & Copper Co., Inc., Baltimore; brass, half hard	4,000
Steel & Wire Products Co., Baltimore; steel strapping	1,065
Stuber & Kuck Co., Peoria, Ill.; containers, tinplate	62,238
Struthers-Wells, Warren, Pa.; superheaters	6,825
United-Carr Fastener Corp., Cambridge, Mass.; dies and tools	3,697
Wallace & Tiernan Co., Inc., Newark; valves	6,880

Navy Dept., Bureau of Supplies and Accounts:

Air Reduction Sales Co., New York; regulators, cylinder	\$121,100
Alemite Co. of Maryland, Baltimore; fittings, gun	59,776
Allis-Chalmers Mfg. Co., Milwaukee; shafts, rough machined	23,052
turbine, steam, rotor	49,400
Aluminum Cooking Utensil Co., New Kensington, Pa.; kettles, steam	10,700

American Hoist & Derrick Co., St. Paul; clips, wire, rope	11,615
American Smelting & Refining Co., New York; copper, cut, ingot	180,505
lead, pig	11,000
American Tool Works Co., Cincinnati; drill, radial	7,255
Apollo Steel Co., Apollo, Pa.; steel, sheet	32,445
Axelson Mfg. Co., Los Angeles; lathe, engine	10,632
Baldt Anchor Chain & Forge Corp., Chester, Pa.; chain, anchor	18,418
Bay City Shovels, Inc., Bay City, Mich.; crane, truck, motor	14,400

Beall Pipe & Tank Corp., Portland, Ore.; tanks, gasoline	16,950
Bendix Aviation Corp., Bendix Products Div., South Bend, Ind.; units, control, pressure, fuel tank	94,619
Bendix Radio Corp., Baltimore; radio set materials	24,547
Bethlehem Steel Co., Bethlehem, Pa.; steel, bar	12,273
Edward G. Budd Mfg. Co., Philadelphia; doors, hatches	714,552
Buffalo Forge Co., Washington; equipment, ventilation	103,233
Buffalo Pumps, Inc., Buffalo; pumps, centrifugal	97,650



METAL SPHERES WITH LAPPED SURFACES

Strom Steel Balls possess that extra measure of quality by means of which the ultimate in ball bearing performance is achieved.

This special lapping practice is exclusive with Strom.

Physical soundness — correct hardness — size accuracy and sphericity are guaranteed in all Strom Balls.

Other types of balls — STAINLESS STEEL — MONEL — BRASS & BRONZE — are also available in all standard sizes. Write for full details.

Strom

STEEL BALL CO.

1850 So. 54th Avenue, Cicero, Ill.

The largest independent and exclusive Metal Ball Manufacturer

GOVERNMENT AWARDS

Carnegie-Illinois Steel Corp., Washington; steel, rivet	27,192
Chambersburg Engineering Co., Chambersburg, Pa.; hammers, drop	39,570
Champion Rivet Co., Cleveland; electrodes, welding	5,345
Chelsea Clock Co., Chelsea, Mass.; clocks, mechanical	66,030
Cincinnati Milling Machine & Cin- cinnati Grinders, Inc., Cincin- nati; machines, milling	21,720
Cincinnati Shaper Co., Cincinnati; brake, press	42,774
Collyer Insulated Wire Co., Paw- tucket, R. I.; cable, electric ...	252,708

Consolidated Supply Co., Portland, Ore.; pipe, iron and steel	61,340
Copeland Refrigeration Corp., Sid- ney, Ohio; refrigerators	25,306
Crown Can Co., Philadelphia; cans, cement, tin	10,556
Curtiss-Wright Corp., Curtiss Aero- plane Division, Buffalo; tanks, auxiliary, aircraft	5,974
Easton Car & Construction Co., Easton, Pa.; trucks, electric ...	11,125
Erie Forge Co., Erie, Pa.; shafts, rough machined	23,185
Farnham Mfg. Co., Buffalo; ma- chines, forming, rolling	10,326

Frederick Iron & Steel Co., Fred- erick, Md.; pumps, gasoline ...	7,749
Garfield Electrical Supply Co., Inc., New York; cable, wire, electric ..	59,623
General Cable Corp., Washington; cable, stranded, copper	48,612
General Electric Co., Schenectady, N. Y.; cable, electric	254,703
General Motors Corp., Chevrolet Div., Detroit; trucks, motor, open, express	5,242
General Motors Corp., Diesel En- gine Division, Cleveland; liners, cylinder	7,820
Gould & Eberhardt, Newark; ma- chine, gear hobbing	13,004
Hard Mfg. Co., Buffalo; letters, metal	23,628
Herrington, King & Co., Boston; rings, hammock	7,829
Hooven, Owens, Rentschler Co., Hamilton, Ohio; parts, repair for main engine	28,840
International Harvester Co., Inc., Washington; trucks, motor ...	30,060
Jack & Heintz, Inc., Cleveland; starters, airplane	39,000
Kearney & Trecker Corp., Milwau- kee; machines, milling	118,101
Lionel Corp., New York; com- passes, boat	29,250
McKeirnan-Terry Corp., Harrison, N. J.; machinery, boat, crane...	109,600
Monarch Machine Tool Co., Sidney, Ohio; lathes, engine	12,520
lathes, geared, head	59,916
Morse Chain Co., Ithaca, N. Y.; chains & sprockets	16,377
Norwalk Tank Co., Inc., South Norwalk, Conn.; tanks, gaso- line	25,678
Otis Elevator Co., Washington; equipments, elevator	45,000
Parker Appliance Co., Cleveland; machines, tube, bending	12,384
Perine Machinery & Supply Co., Inc., Seattle; mill, boring, ver- tical	34,002
Phelps Dodge Copper Products Corp., Habirshaw Cable & Wire Division, New York; cable, elec- tric	252,760
Pittsburgh Screw & Bolt Corp., Pittsburgh; rivets, tap	127,559
Republic Steel Corp., Cleveland; steel, alloy, bar	68,980
Republic Steel Corp., Cleveland; steel, rivet	52,260
Rockbestos Products Corp., New Haven, Conn.; cable, electric...	252,824
Rockford Machine Tool Co., Rock- ford, Ill.; shapers, hydraulic ...	39,354
Joseph T. Ryerson & Son, Inc., Chicago; roll, plate bending...	8,461
Sanson & Rowland, Inc., Philadel- phia; screws, set, steel.....	5,010
Scrimgeour, William, Washington; forks, table	70,580
equipments, seaplane ration, jugs, bottles	8,083
Shepard Niles Crane & Hoist Corp., Philadelphia; cranes, elec- tric	21,006
Stedfast & Roulston, Inc., Boston; mills, boring	24,864
Swind Machinery Co., Philadel- phia; presses, trimming	7,350
H. B. Underwood Corp., Philadel- phia; machines, milling	9,018
U. S. Axle Co., Inc., Pottstown, Pa.; trucks, dummy, car	41,150
Vacuum Can Co., Chicago; car- riers, food	7,262
Vandyck Churchill Co., New York; mills, boring	24,835
Warren Steam Pump Co., Inc., New York; pumps, main con- denser, circulating	708,328
S. Weinstein Supply Co., New York; hinges, wrought steel ...	11,118
Westinghouse Electric & Mfg. Co., East Pittsburgh; fans, electric...	5,830



DRAVO

MATERIAL HANDLING EQUIPMENT

Shown here are eight outstanding Dravo-built rigs—each an answer to a specific problem involving material handling.

Complete coordinated facilities for engineering, fabricating and erecting efficient structures are available at Dravo. Consult with us on the building of new terminal facilities—or the modernization of existing equipment.

DRAVO CORPORATION
ENGINEERING WORKS DIVISION

GENERAL OFFICES AND SHOPS: NEVILLE ISLAND, PITTSBURGH, PA.

GOVERNMENT AWARDS

Yates-American Machine Co., Beloit Wis.; shapers, woodwork	7,313
Youngstown Sheet & Tube Co., Youngstown; steel, bar	61,966
steel, sheet	11,931

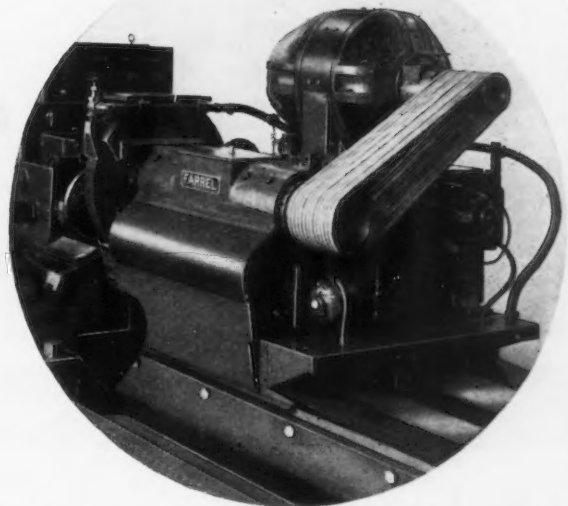
Iron and Steel Products...\$15,807,698

Allegheny Ludlum Steel Corp., Brackenridge, Pa.; steel	\$145,740
American Bridge Co., Cincinnati; steel beams	15,392
American Emblem Co., Inc., New Hartford, N. Y.; uniform but- tons	42,400
American Hardware Corp., New Britain, Conn.; fuse parts	114,495
American-La France-Foamite Corp., Elmira, N. Y.; gas cylinders, etc.	22,467
American Locomotive Co., Sche- nectady; forgings	30,433
American Welding Co., Pittsburgh; steel containers	58,650
Apollo Steel Co., Apollo, Pa.; steel	14,300
Atlas Tack Corp., Fairhaven, Mass.; nails, brads	15,916
Bethlehem Steel Co., Bethlehem, Pa.; forgings	1,420,000
rails and fittings	33,072
Bethlehem Steel Co., San Fran- cisco; steel towers	299,668
Bethlehem Steel Export Corp., New York; bar steel	24,486
S. Blickman, Inc., Weehawken, N. J.; dishwashing baskets	55,500
Bridgeport Thermostat Co., Bridge- port, Conn.; practice bombs	217,728
Edward G. Budd Mfg. Co., Phila- delphia; parts for bombs	3,409,338
Buffalo Bolt Co., North Tona- wanda, N. Y.; bolts, nuts	22,240
Cincinnati Galvanizing Co., Cin- cinnati; buckets	76,472
Colorado Fuel & Iron Corp., Den- ver; reinforcement bars	10,731
nails	15,123
Columbia Steel Co., Seattle; rails and bars	14,777
cable	10,731
Columbiana Boiler Co., Columbi- ana, Ohio; steel containers	58,820
Commercial Shearing & Stamping Co., Youngstown, Ohio; super- structures	30,000
Consolidated Supply Co., Portland, Ore.; pipe	12,930
Crane Co., Philadelphia; valves.. steel pipe	18,842
cast iron pipe	11,000
Crosbee-Clark Co., Philadelphia; tools	12,265
Crucible Steel Co. of America, New York; tool steel	12,845
steel	383,923
bar steel	13,729
Cushman Motor Works, Lincoln, Neb.; fuse parts	25,923
Dohrmann Hotel Supply Co., Los Angeles; galley and scullery equipment	582,000
Eastern Rolling Mill Co., Balti- more; sheet steel	11,365
E. H. Edwards Co., San Francisco, Cal.; wire rope	24,825
Electro Metallurgical Sales Corp., New York; ferromanganese	17,834
Ex-Cell-O Corp., Detroit; tanks	13,141
Flour City Ornamental Iron Co., Minneapolis; reel	37,625
Herring Hall Marvin Safe Co., Hamilton, Ohio; safes	22,176
Highway Materials Co., Jackson, Miss.; steel bars	57,816
Hyman-Michaels Co., San Fran- cisco; rail and track material..	25,658
Keystone Steel & Wire Co., Peoria, Ill.; nails	16,569
Lowell Wrench Co., Worcester; wrenches	21,468
Lukens Steel Co., Coatesville, Pa.; steel rings	22,308
Magor Car Corp., New York; scoops	32,120
	13,146

Manning, Maxwell & Moore, Inc., Bridgeport, Conn.; valves	34,664
Marine Specialty Co., Long Beach, Cal.; valves	18,270
McArdle & Cooney, Inc., Philadel- phia; adapters	14,420
McKay Co., Pittsburgh; chains and bridles	57,897
Geo. L. Mesker & Co., Evansville, Ind.; airplane hangar	16,355
Morse Chain Co., Ithaca, N. Y.; chains and sprockets	16,377
Nathan Mfg. Co., New York; fit- tings, water-gage-glass	42,275
Noland Co., Inc., Washington; water closets	197,780
Norris Stamping & Mfg. Co., Los Angeles; ammunition boxes	664,240

Norton Door Closer Co., Div. of Yale & Towne Mfg. Co., Chi- cago; door closers	11,842
Nicholson File Co., Providence; files	16,481
Poor & Co., Canton Forge & Axle Works, Canton, Ohio; drop forgings	11,230
National Iron Works, San Diego, Cal.; frame nests	10,201
National Tube Co., McKeesport, Pa.; forging	3,580,199
Republic Steel Corp., Massillon, Ohio; sheet steel	15,993
steel	10,562
Russell Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.; bolts and nuts	179,309

**Spindle
Design and
Construction
Contribute
to Close
Accuracy
and Fine
Finish
of**



FARREL ROLL GRINDERS

Contributing substantially to the high precision and fine finish for which Farrel Heavy Duty Roll Grinders are noted are the construction and mounting of the grinding wheel spindle. Heavy, rigid and smooth-running, the wheel spindle is one of the outstanding design features of the machine.

For rigidity under working load the spindle is made as large as possible in diameter. It is made of high grade alloy steel, carefully machined, heat treated and ground to extremely close limits of accuracy. It is mounted in special bronze alloy, or steel-backed, bab-bitt-lined bearings of the sleeve

type, split longitudinally to fit a wedge by means of which the running clearance is closely controlled.

Thrust on the spindle is taken by a hardened steel disc and two babbitted rings at the center of the spindle, which permits free expansion of the spindle bearings and minimizes deflection of the spindle under thrust load.

Vibrationless, multiple V-belt drive, continuous automatic lubrication and other Farrel features combine to assure the smooth-running spindle needed to deliver continuously close accuracy and fine finish of ground rolls.

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E18



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GOVERNMENT AWARDS

Sargent & Co., New Haven, Conn.; bolt hooks	14,500
Savory, Inc., Newark; measures, pans	19,772
Service Steel Co., Detroit; steel tubing	18,941
Sharpsville Steel Fabricators, Inc., Sharpsville, Pa.; tanks	373,200
Smith Bros. Mfg. Co., Findlay, Ohio; shell	128,384
Standard Nut & Bolt Co., Valley Falls, R. I.; bolts	45,669
Summerill Tubing Co., Bridgeport, Pa.; steel tubing	11,201
Talon, Inc., Meadville, Pa.; slide fasteners	195,669
Taylor-Wharton Iron & Steel Co., Hamilton, Ohio; safes	57,816
Henry G. Thompson & Son Co., New Haven, Conn.; saw blade	11,652
Tubular Service Corp., Cambridge, Mass.; steel tubing	10,754
Tubular Service Co., Detroit; steel tubing	18,941
Utica Drop Forge & Tool Corp., Utica, N. Y.; pliers	30,088
Walworth Co., New York; valves	14,065
Warren Webster & Co., Camden, N. J.; booster pts.	663,000
Waterbury Button Co., Waterbury, Conn.; uniform buttons	59,003
Frank M. Weaver & Co., Inc., Lansdale, Pa.; fab. structural steel	10,925
Harry C. Weiskittel Co., Baltimore; gas ranges	13,485
Western Pipe & Steel Co. of Cal., San Francisco; steel penstock ..	1,587
buoys	41,210
J. H. Williams & Co., Buffalo; wrenches	53,179

Yale & Towne Mfg. Co., Stamford, Conn.; padlocks	19,840
Youngstown Sheet & Tube Co., Youngstown, Ohio; sheet steel ..	14,769

Nonferrous Metals and Alloys\$2,322,596

Aluminum Co. of America, Washington; aluminum pigment	\$67,863
aluminum alloys	21,249
American-La France-Foamite Corp., Elmira, N. Y.; fire extinguishers ..	12,279
American Metal Co., Ltd., New York; ingot copper	142,780
American Smelting & Refining Co., New York; ingot copper	122,854
Bridgeport Brass Co., Bridgeport, Conn.; discs	51,040
Bridgeport Rolling Mills Co., Bridgeport, Conn.; cartridge brass	53,448
Caswell, Strauss & Co., Inc., New York; pig tin	536,149
Chase Brass & Copper Co., Inc., Waterbury, Conn.; cartridge brass	51,701
brass	23,143
C-O-Two Fire Equipment Co., Newark; fire extinguishing apparatus	10,317
Grimes Mfg. Co., Urbana, Ohio; lamp assys.	232,530
Handy & Harman, New York; silver brazing alloy	11,580
International Minerals & Metals Corp., New York; slab zinc ...	34,128
International Nickel Co., Inc., New York; alloy cylinders	42,238
National Lead & Oil Co. of Pa., Pittsburgh; solder	10,708

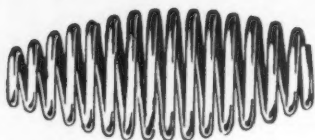
Revere Copper & Brass, Inc., Baltimore Div., Baltimore; brass ..	567,379
Waltham Watch Co., Waltham, Mass.; escape springs	41,250
Wolverine Tube Co., Detroit; brass pipe	19,425

Other Machinery\$4,695,727

Acme Die & Machine Co., Latrobe, Pa.; primer detonator	\$61,913
Acme Machine Tool Co., Cincinnati; lathes	29,992
Aerial Machine & Tool Corp., New York; release	10,500
Allis-Chalmers Mfg. Co., Milwaukee; air compressor	47,200
American Brake Shoe & Foundry Co., Kellogg Div., Rochester, N. Y.; jig assys.	11,805
American Gen. & Arm. Co., Chicago; generators	22,000
American Mach. & Metals, Inc., Troy Laundry Mach. Div., East Moline, Ill.; ironers	15,000
Baker Hamilton & Pacific Co., San Francisco; hoists	30,714
Bendix Aviation Corp., Eclipse Aviation Div., Bendix, N. J.; generators	222,852
Buffalo-Springfield Roller Co., c/o Hovey-King, Washington; roller, water ballast	34,825
Bunnell Machine & Tool Co., Cleveland; stand assys.	36,208
Cincinnati Shaper Co., Cincinnati; shear machs.	17,583
Climax Engineering Co., Clinton, Iowa; power unit	63,947
A. C. Colby Machinery Co., New York; lathes	13,866
Consolidated Machine Tool Corp., Rochester, N. Y.; mill	184,704
Continental Machines, Inc., Minneapolis; sewing machines	16,794
Continental Motors Corp., Muskegon, Mich.; generator	11,967
M. T. Davidson Co., Brooklyn; pumps	143,602
Detroit Broach Co., Inc., Detroit; broaching equip.	44,868
DeVilbiss Co., Toledo, Ohio; paint spray gun	13,002
Eccles & Davies Machine Co., Inc., Los Angeles; milling machines, shaper	14,640
lathes	35,845
Edison-Splitdorf Corp., West Orange, N. J.; plugs, engines..	13,000
Electric Hotpack Co., Inc., Fox Chase, Pa.; electric baker	24,265
Fairbanks, Morse & Co., Kansas City; pumping units	13,532
Fox Munitions Corp., Philadelphia; gages	10,926
Gallmeyer & Livingston Co., Grand Rapids, Mich.; grinders	11,483
General Steel Castings Corp., Eddystone, Pa.; foundation plates ..	120,840
James W. George, Detroit; lathes ..	55,967
Gisholt Machine Co., Madison; lathes	41,078
Claud S. Gordon Co., Chicago; tool furnaces	17,325
Gould & Eberhardt, Newark; shapers	11,594
Hall Mfg. Co., Toledo, Ohio; grinders	10,010
Hanson-Whitney Machine Co., Hartford; thread gages	30,531
gages	21,006
Hardie Tynes Mfg. Co., Birmingham, Ala.; air compressors	86,186
Hardinge Brothers, Inc., Elmira, N. Y.; milling machs.	21,279
Harnischfeger Corp., Milwaukee; crawler crane	37,600
Harron, Rickard & McCone Co., Los Angeles; milling machines ..	37,836
shaper	12,706

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- * Allowing for set if compressed solid when assembling.
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Clinton E. Hobbs Co., Everett, Mass.; chain blocks	25,268
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio; press	17,005
Ingersoll-Rand Co., Washington; air compressors	17,850
Jones & Lamson Machine Co., Springfield, Vt.; grinding mach.	29,496
Kearney & Trecker Corp., Milwaukee; milling machines	10,110
William H. Keller, Inc., Grand Haven, Mich.; pneumatic screw driver	19,327
Kingston Products Corp., Kokomo, Ind.; shell	381,000
E. A. Kinsey Co., Cincinnati; chain hoist	17,864
Link-Belt Co., Indianapolis, Ind.; burster parts	84,382
Lloyd & Arms, Inc., Philadelphia; lathes	29,190
Machinery Sales Co., Los Angeles; milling machines	20,905
shaper, grinders	10,319
Mich. Tool Co., Detroit; worm gear units	436,680
Modern Equipment Co., Port Washington, Wis.; turntables	10,607
Monarch Machine Tool Co., Sidney, Ohio; lathes	27,667
Moore Machinery Co., Los Angeles; lathes	16,900
Natural Asphalt Corp. of Va., Richmond; distributors for road oils	28,980
Norton Co., Worcester; grinders.	19,902
Okura & Co., New York; planer type miller	52,510
Oliver Machinery Co., New York; band saws	19,080
Otis Elevator Co., Buffalo; steel castings	20,000
Chas. W. Ozias, operating recr., Patterson Tool & Supply Co., Dayton, Ohio; chain hoist	23,495
Paxton-Mitchell Co., Omaha, Neb.; anchor	13,450
Peck, Stow & Wilcox Co., South- ington, Conn.; metal working machinery	115,470
Perine Mach. & Supply Co., Inc., Seattle; mill	34,002
H. K. Porter Co., Inc., Pittsburgh; chemical shells	475,408
Prosperity Co., Inc., Syracuse, N. Y.; laundry unit	12,620
Pump Engineering Service Corp., Cleveland; oil pump	27,450
Pratt & Whitney Div., Niles-Bement-Pond Corp., West Hart- ford; drills	16,776
R. & M. Mfg. Co., Royal Oak, Mich.; gages	16,081
Reed-Prentice Corp., Worcester; lathes	117,260
Schauer Machine Co., Cincinnati; lathes	26,401
Singer Sewing Machine Co., New York; sewing machines	10,881
Somerville Machine & Foundry Co., Somerville, Mass.; castings	34,117
South Bend Lathe Works, South Bend, Ind.; lathes	330,244
Standard Machinery Co., Provi- dence; bearings	141,120
Steel Products Engineering Co., Springfield, Ohio; vacuum equip.	54,417
Tidewater Supply Co., Inc., Nor- folk, Va.; shapers	16,935
United States Hoffman Mach. Corp., New York; laundry unit.	11,628
Van Norman Machine Tool Co., Springfield, Mass.; milling machines	27,619
Wayne Tool Co., Waynesboro, Pa.; countersinks	25,349
Weaver Mfg. Co., Springfield; jacks and tow bars	12,817
Weber & Co., San Francisco; crane	14,965
Wiedemann Machine Co., Philadel- phia; gages	21,280

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Worthington Pump & Mach. Corp., Washington; compressor units, drills	20,990
compressors	49,122
Yates American Machine Co., Beloit, Wis.; electric moulder...	22,974

Other Government Awards

Eclipse Fuel Engineering Co., Rockford, Ill.; furnaces	5,340
Electric Auto-Lite Co., Wire Division, Port Huron, Mich.; cable, ignition	4,200
Elliott-Lewis Electric Co., Philadel- phia; wire	2,393
Equipment Co., Detroit; cutters...	3,897
Ex-Cell-O Corp., Continental Tool Works Division, Detroit; mills...	2,750
Ferracute Machine Co., East Bridgeton, N. J.; presses	4,285
Firth Sterling Steel Co., Philadel- phia; steel, tool	1,837
Gary Screw & Bolt Co., Chicago; rivets	2,310
Hamilton Watch Co., Lancaster, Pa.; small arms material	23,400
Hannifan Mfg. Co., Chicago; chucks	1,148
Hanson-Van Winkle-Munning Co., Matawan, N. J.; generators ...	3,575
Louis Hansen's Sons, Davenport, Iowa; hardware	1,859
S. M. Howes Co., Boston; bronze castings	33,264
Illinois Tool Works, Chicago; broaches	1,800
Johnson Claffin Corp., Marlboro, Mass.; gages	4,625
Krueger, H. R., & Co., Detroit; machines, drilling	5,941
Larkin Packer Co., Davis Boring Tool Division, St. Louis; bars, boring	1,305
Lincoln Engineering Co., St. Louis; fittings	1,361
Lindberg Engineering Co., Chi- cago; furnaces	4,855
Maxson Corp., W. L., New York; amplifiers	1,800
Mohawk Machine & Tool Co., New York; gages	1,176
Morgan Machine Co., Rochester, N. Y.; machines, nailing	2,970
National Tube Co., McKeesport, Pa.; gages	2,550
New York Thread Grinding Corp., New York; gages	1,010
Niles-Bement-Pond Co., Pratt & Whitney Division, West Hart- ford; cutters	5,969
Pangborn Corp., Hagerstown, Md.; machines, blasting	3,424
Pick Mfg. Co., West Bend, Wis.; frames, target	163,370
Remington Arms Co., Peters Car- tridge Division, Bridgeport; small arms materiel	253,468
Republic Steel Corp., Cleveland; steel, nickel	241,455
steel, chromium	1,817
Revere Brass & Copper Co., Balti- more Division, Baltimore; brass	130,890
Rogers Lunt & Bowlen Co., Green- field, Mass.; rings	1,941
B. M. Root Co., York, Pa.; ma- chines, belt sanding	1,325
Rudolph & West Co., Washington; drills	2,104
S.K.F. Industries, Inc., Philadel- phia; bearings, roller	8,221
Somerville Machine & Foundry Co., Somerville, Mass.; castings	17,010
Standard Alloy Co., Cleveland; baskets	3,037
Sterling Products Co., Inc., Mo- line, Ill.; screws	2,243
Strong Steel Foundry Co., Buf- falo; castings	4,918
Taft-Peirce Mfg. Co., Woonsocket, R. I.; gages	2,455

Tools & Gages, Inc., Cleveland; gages	6,185
Nathan Trotter Co., Philadelphia; tin, pig	5,135
Troy Tool & Gage Co., Detroit; gages	1,920
Universal Power Corp., Cleveland; welder	1,000
Veit & Young, Philadelphia; tools	13,226
Vinco Corp., Detroit; gages	5,477

**New Steel Siding Is
Used in Defense Housing***Washington*

••• A new type of steel siding is being used with good results in a few of the War Department housing projects by the Quarter-master Corps as part of the national defense program.

The material is shaped like the siding normally used in house construction but is provided in sheets 2 ft. wide and up to 10 ft. in length.

Plans and specifications for a housing project are given to the supplier of the steel siding, and all the necessary pieces are cut to exact size by machines in the supplier's plant. They are then given a prime coat of paint and shipped to the Army post, camp or station ready to use.

In the construction of a housing unit, the usual lumber framework of rafters and studs is used but the studs are placed 2 ft. apart. The steel sheets of siding are installed from the bottom up and are so designed that, when properly installed, weatherproof joints are made between the sheets. The sheets are nailed to the studs and overlapping sheets are bolted together between the studs.

"With the use of this material, an insulating material is placed on the inner face of the studs to form an interior finish," the announcement said. "This gives an interior finish in all weather zones, something which is not being done with other siding materials except in the 20 deg. F. zone. With the enclosed airspace between the interior and exterior walls, unusually good insulation is provided.

"Preliminary tests indicate that this new type of siding provides a structurally sound building and one finished on the interior. With a prime coat of paint on the siding sheets when they are received, less painting is required on the job."

**Director of Purchases
Given More Powers***Washington*

••• The Office of Production Management last week publicized what was described as an improved method of handling purchases and a clarification of the working arrangements between the War and Navy Departments and the OPM.

Under the new plan, which vests greater authority in Director of Purchases Donald M. Nelson, the Army and Navy will continue the initiation and execution of contracts and will have final responsibility for product specification and for the fixing of delivery dates on needed items, but Mr. Nelson will review certain procurement methods, policies and specification and will advise and make recommendations on such highly technical items as "will facilitate the efficient procurement."

Other important proposals for purchases, or those involving unusual procurement problems or likely to leave substantial impacts on the market, will be submitted by the War or Navy Department to Mr. Nelson at his request. Also, all contracts for \$500,000 or more will be submitted to him for clearance before actual awards are made.

Under the terms of the new working arrangement, the provisions of which suggested that there has been confusion in government purchasing policies, the War and Navy Departments will continue to furnish Mr. Nelson with information on items to be acquired, together with delivery scheduled and specifications. Mr. Nelson's division hereafter will constitute that part of the OPM which will coordinate the placing of major defense orders and advise the established defense agencies on procurement and planning aspects of their schedules.

Monarch Pays \$1 Dividend

••• Directors of Monarch Machine Tool Co., Sidney, Ohio, at a meeting held Feb. 14, declared a dividend of \$1.00 per share to be paid on March 1 to stockholders of record at the close of business on Feb. 21.

Defense Needs Will Cut Exports to U.S.S.R.

Washington

• • • Lifting by the United States government of the moral embargo against certain shipments to Russia is not expected to have as much effect on exports to that country of steel and machinery as the growing pressure for these lines for defense needs. The moral embargo did not directly cover steel and machinery. Their exportation is controlled by the export licensing system. The moral embargo applied to airplanes, essential materials for their manufacture, which require steel and machinery, and also to patent processes for producing highest-grade aviation gasoline.

Great Britain is interested over the lifting of the moral embargo and is exerting pressure to seal leaks in essential war supplies by which American shipments to Russia reach Germany. Particular British interest appears to be felt over American cotton shipments to Russia, but it likewise is the British view that other American materials that can be used for military purposes are getting into the Reich from Russia.

Viscount Halifax, British Ambassador, who recently conferred with Under-Secretary of State Welles, said afterward:

"We think a good deal, a considerable amount of materials are going through Russia to Germany."

Lord Halifax said that he was not particularly concerned with the transshipment of American-made goods from Russia to Germany but that "It is the sum total of all materials shipped into Russia from all countries that we must look into."

Secretary of State Hull has pointed out that the United States continued to exercise control of exports through the system of export licenses. It was stated the removal of the moral embargo was psychological more than anything else and removed a cause for Russian complaint of discrimination.

Russia took only 33,986 gross tons of steel from the United States in the first 11 months of 1940 compared with 28,105 tons

UNITED STATES EXPORTS OF MACHINE TOOLS, BY MONTHS, TO ENGLAND, FRANCE, RUSSIA, JAPAN AND CANADA, 1939 AND 1940

	England	France	Russia	Japan	Canada	World Total
1939						
Jan.	\$782,001	\$491,620	\$1,114,804	\$1,870,476	\$285,465	\$5,108,734
Feb.	839,676	763,287	1,588,369	2,063,891	214,290	6,414,069
Mar.	1,108,034	1,055,112	3,151,774	2,772,419	219,588	9,500,285
Apr.	1,122,960	1,421,713	1,349,167	1,376,964	163,305	6,411,037
May	1,792,358	1,925,338	1,183,189	2,505,644	342,150	9,340,445
June	1,576,690	1,442,455	.....	1,398,379	228,033	6,732,542
July	2,381,459	2,013,441	1,545,683	1,133,350	268,212	8,182,038
Aug.	2,273,456	1,804,827	1,314,970	1,376,730	344,287	8,182,774
Sept.	2,959,598	1,918,024	376,854	1,408,814	432,323	7,904,437
Oct.	3,394,033	1,578,622	793,491	900,872	479,320	8,046,187
Nov.	2,695,145	884,653	1,613,365	1,430,833	405,371	7,838,879
Dec.	4,644,335	1,804,664	1,382,602	1,573,154	531,425	10,742,345
TOTAL	\$25,569,745	\$17,103,756	\$15,414,268	\$19,811,526	\$3,913,769	\$93,403,772
1940						
Jan.	\$4,476,881	\$1,791,172	\$1,748,577	\$2,279,854	\$437,080	\$11,628,234
Feb.	5,114,191	2,866,784	1,445,173	1,236,291	341,343	12,022,454
Mar.	5,009,607	4,412,095	2,109,785	2,370,560	526,513	15,633,850
Apr.	5,202,015	6,679,538	2,229,764	2,006,319	619,797	17,910,735
May	5,744,189	6,567,735	91,946	1,972,345	508,970	16,205,128
June	4,966,898	6,023,335	995,814	864,062	639,025	14,322,047
July	7,954,726	203	1,394,167	1,322,502	635,322	11,922,063
Aug.	12,480,621	.....	1,795,826	1,875,503	1,582,273	18,913,680
Sept.	15,070,249	.....	894,999	587,632	2,181,304	19,847,805
Oct.	19,902,633	.....	125,701	1,393,434	2,678,330	25,601,965
Nov.	19,218,029	.....	1,025,208	478,008	2,614,978	24,835,175
Dec.	19,574,246	.....	459,960	664,849	3,006,449	24,982,692
TOTAL	\$124,714,285	\$28,340,862	\$14,316,920	\$17,051,359	\$15,771,384	\$213,825,328

UNITED STATES EXPORTS OF ROLLING MILL MACHINERY, BY MONTHS, TO JAPAN, RUSSIA, CANADA, ENGLAND, BRITISH INDIA, 1939 AND 1940

	Japan	Russia	Canada	England	British India	World Total
1939						
Jan.	\$230,510	\$238,125	\$28,577	\$12,949	\$85,882	\$603,402
Feb.	409,710	126,303	41,705	18,394	34,304	675,551
Mar.	322,318	41,710	65,773	1,071,625	9,747	1,619,110
Apr.	199,848	.....	54,128	1,109,638	94,070	1,476,816
May	59,158	.....	54,849	1,089,610	.....	1,209,654
June	3,289	.....	36,940	154,888	147,093	387,114
July	174,209	239,604	87,984	64,667	18,228	588,126
Aug.	166,855	251,428	46,317	183,661	30,329	755,812
Sept.	616,472	.....	62,283	126,647	45,098	1,038,370
Oct.	53,305	52,675	88,808	19,954	166,189	381,931
Nov.	4,523	30,616	63,097	48,271	7,250	161,368
Dec.	794,274	.....	122,566	90,083	63,877	1,113,354
TOTAL	\$3,034,471	\$980,461	\$753,027	\$3,990,387	\$702,067	\$10,010,608
1940						
Jan.	\$1,023,430	\$91,379	\$92,106	\$216,639	\$7,642	\$1,443,333
Feb.	540,579	12,971	151,853	7,586	121,434	852,075
Mar.	886,434	29,579	104,242	299,098	81,209	1,414,317
Apr.	807,469	563,217	258,894	96,828	71,459	1,867,793
May	402,617	.....	263,479	115,668	63,251	914,454
June	811,532	1,302,968	218,938	10,999	145,728	2,884,832
July	52,595	595,376	154,742	115,619	72,749	1,006,770
Aug.	58,677	681,835	87,502	253,159	28,956	1,175,648
Sept.	29,124	855,004	63,595	69,765	22,783	1,100,016
Oct.	36,146	4,490	83,170	178,388	864	368,777
Nov.	92,141	860,559	222,416	215,887	59,928	1,653,819
Dec.	441,724	180,060	265,223	64,879	6,178	1,193,597
TOTAL	\$5,182,468	\$5,177,438	\$1,966,160	\$1,644,515	\$682,181	\$15,875,431

in the corresponding period of 1939. Of the 1940 shipments 28,615 tons consisted of casing and oil line pipe and 3013 tons of tin plate. Taking a wide variety of products Japan imported 302,382 tons of steel from the United States in the first 11 months of

1940 compared with 155,359 tons in the corresponding period of 1939.

At the same time Russia has been a large buyer of American machine tools and rolling mill equipment. She and Japan, the largest foreign purchasers last

year of American rolling mill machinery, took almost the same quantity of this equipment for the rolling of steel, shipments to Japan being valued at \$5,182,468 while those exported to Russia were valued at \$5,177,438. After the export licensing system went into effect in July these shipments to Japan whether by coincidence or because of application of export control dropped abruptly, until December, when they rose to almost one-half million dollars in value. No such trend was shown regarding similar shipments to Russia was reflected, except for a single month, October, they declined in value less than \$5,000.

Rolling mill machinery shipments to England were higher in 1939 than in 1940 and valued at \$3,990,387 in the earlier year, the bulk of these exports were shipped prior to the breaking out of hostilities in September. Canada on the other hand took 250 per cent more rolling mill equipment from the United States in 1940 than in 1939, the respective values being \$1,966,160 and \$753,027.

Exports of American machine tools in 1940 vividly tell the tragic story of the fall of France. Mounting to a maximum of \$6,679,538 in April, they continued above the \$6,000,000 through the succeeding two months, and ebbed to the pitiful trickle of \$203 in July 1, the month of capitulation. Diverted from France thereafter these exports to England rose sharply, jumping from approximately \$5,000,000 in June to almost \$8,000,000 in July and reaching almost \$20,000,000 in October, with only slight declines in November and December to make a total value of \$124,714,285 for the year compared with \$28,340,862 for France, the next largest foreign buyer despite her mid-year collapse.

Both Russia and Japan took large quantities of machine tools in 1940 in the face of export control. Now that pressure for these tools for American defense needs has grown stronger interest is shown whether there will be a drop in such exports.

American exports of machine tools to Russia and Japan last year were valued at \$14,316,900 and \$17,051,359 respectively.

Defense Plant Expansion Contracts for January Total \$375,685,332

(Plant expansion contracts awarded in January 1941 by the War and Navy Departments covered projects in 19 states. The total of \$375,685,332 compares with slightly under \$700,000,000 for the previous seven months.)

Aviation Corp., Detroit (Navy)	Additional machinery tools for airplane engine parts	\$ 532,000
E. B. Badger & Sons Boston (War)	Construction TNT-DNT plant at Sandusky, Ohio	9,388,330
Bohn Aluminum & Brass Corp., Detroit (Navy)	Additional plant facilities, tools for airplane engine parts	1,216,000
Camden Forge Co., Camden, N. J. (Navy)	Equipment, plant for heavy forgings	3,125,610
Curtiss-Wright Corp., New York (War)	New propeller plant, Pittsburgh expansions, Caldwell, Indianapolis, N. J.	14,090,350
Cummins Constr. Corp. & Riggs Distler & Co., Baltimore, (War)	Plant facilities, Edgewood Arsenal, Aberdeen Proving Ground, Md.	1,130,684
E. I. du Pont de Nemours, Wilmington, Del. (War)	Construction, equipment smokeless powder plant, Childersburg, Ala.	47,997,000
E. I. du Pont de Nemours, Wilmington, Del. (War)	Increased facilities, Indiana Ordnance Works, Charlestown, Ind.	23,000,000
E. I. du Pont de Nemours, Wilmington, Del. (Navy)	Expansion of Naval powder factory, Indian Head, Md.	3,490,000
Ex-Cell-O Corp., Detroit (Navy)	Plant facilities for aircraft engine parts ...	1,689,678
Fairchild Engine & Airplane Corp., Farmingdale, N. Y. (Navy)	Construction, installation additional facilities equipment	1,478,800
H. K. Ferguson Co., Cleveland; Oman Constr. Co., Nashville, Tenn. (War)	Construction ammunition-loading plant at Milan, Tenn.	8,514,370
Fruin-Conlon Contracting Co., St. Louis; Fruco Const. Co., St. Louis; Massman Constr. Co., Kansas City, Mo. (War)	Construction of small arms plant at St. Louis	11,819,400
Foot Gear & Machine Co., Chicago (Navy)	Additional machinery, equipment for making aircraft engine gears	920,000
General Motors Corp. (Buick), Detroit (Navy)	Expansion facilities for making Pratt & Whitney "1830" engines	24,313,150
Hartford Machine Screw Co., Hartford (Navy)	Expansion equipment for manufacturing airplane engine parts	469,000
Hughes-Foulkrod Co., Philadelphia (Navy)	Structural shop, welding rooms, Philadelphia	548,100
Lawson Machine & Tool Co., Malden, Mass. (Navy)	Increase in facilities for making aircraft engine parts	60,000
Lukens Steel Co., Coatesville, Pa. (Navy)	Additional equipment increasing capacity of 206-in. mill	2,160,000
Mason & Hanger Co., New York (War)	Construction of bag-loading plant near Pulaski, Va.	9,376,390
M. B. Mfg. Co., New Haven, Conn. (Navy)	Enlarging plant for manufacturing aircraft engine parts	96,000
New Britain Machine Co., New Britain, Conn. (Navy)	Plant, equipment for manufacture of aircraft engine parts	409,000
North American Aviation, Inc., Inglewood, Cal. (War)	Expansion plant facilities for making aircraft frames	2,270,405
New Process Gear Corp., Syracuse, N. Y. (Navy)	Machinery, other equipment for making plane propeller parts	348,000
Perkins Machine & Gear Co., West Springfield, Mass. (Navy)	Machinery for manufacture of aircraft engine parts	269,000
Omaha Steel Co., Omaha, Neb. (War)	Equipment for manufacture of ordnance items	483,875
Remington Arms Co., Inc., Bridgeport, Conn. (War)	Small arms ammunition plant near Denver, Colo.	14,800,000
Reynolds Corp., Richmond, Va. (Navy)	Plant for manufacture of ordnance equipment near Macon, Ga.	1,673,315
Stewart-Warner Co., Chicago (War)	Enlarging plant for manufacture of ordnance items	4,000,000
Studebaker Corp., South Bend, Ind. (War)	Expansion of aircraft facilities, South Bend, Ind., and Chicago	36,799,300
Todd Galveston Dry Docks, Inc., Galveston, Texas (Navy)	New plant, South Bend; gear plant at Fort Wayne, Ind.; parts plant, Chicago....	49,786,149
Union Switch & Signal Co., Swissvale, Pa. (Navy)	New plant including floating dry dock ...	2,254,343
Westinghouse Electric & Mfg. Co., Pittsburgh (Navy)	Acquisition, construction of machinery and tools	1,243,000
Winston Bros Co., C. F. Haglin & Sons, Inc., Minneapolis; Missouri Valley Bridge & Iron Co., Leavenworth, Kan. (War)	Naval ordnance plant at Canton, Ohio	16,000,000
Worthington Pump & Machinery Co., Holyoke, Mass. (Navy)	Construction equipment bag-loading plant at Charlestown, Ind.	17,600,526
Wright Aeronautical Corp., East Paterson, N. J. (War)	Increase in facilities for making aircraft engine parts	269,000
Wright Aeronautical Corp., Lockland, Ohio (War)	Additional facilities for manufacturing aircraft engines	1,500,000
	Plant for manufacturing aircraft engines.	42,488,548

\$287 Million Defense Road Plan Proposed

Washington

• • • A \$287,000,000 program for immediate defense highway construction and the planning of post-emergency highway improvements has been recommended to the White House by the Public Roads Administration.

Detailed recommendations included a proposed appropriation of \$150,000,000 for immediate construction of access roads to serve military and naval reservations and defense industries. This would be carried out by the Public Roads Administration in cooperation with state highway departments and would be paid for entirely by federal funds. Also sought is a \$100,000,000 appropriation for immediate strengthening of sections of the national highway system regarded by the War and Navy Departments as weak sections in a "strategic network."

A \$25,000,000 appropriation for construction and repair of special tactical roads designated by the War Department, and an appropriation of \$12,000,000 for planning post-emergency improvements also were proposed in a report transmitted to President Roosevelt by Federal Works Administrator John M. Carmody.

Booklet Describes Machine Tools' Part in Defense

• • • How the nation's machine tool industry is turning out lathes, milling machines, boring mills, planers and other types of machine tools for the defense program at the rate of \$650,000,000 a year, almost four times the production rate of the peak year of 1929, is told in a booklet entitled *Machine Tools* just published by the National Machine Tool Builders' Association, Cleveland. Featured in the booklet as illustrative of special-purpose machines being built by the industry to speed up defense production is a 24-ton automatic machine for roughing out marine engine cylinders. Operating on six cylinders at one time, this new unit has cut machining time per part from 4 hr. to less than 35 min.

Chain Belt, at 50, Sets Sales Record

• • • Chain Belt Co., Milwaukee, celebrating its 50th anniversary year, announces that its sales in 1940 were the highest in its history and that net profits totaled \$1,039,075, equal to \$2.13 per share on 286,735 shares. This compares with a 1939 profit of \$936,651 or \$1.92 a share.

Philadelphia Tool Engineers Hold Show and Dinner

• • • The largest banquet ever staged by the American Society of Tool Engineers took place at the Penn Athletic Club in Philadelphia on Feb. 15, when more than 1100 members and guests of the local chapter sat down to dinner. The banquet followed an exhibit held during the day. Among the 40 exhibitors, most of whom were local distributors, was one by the Frankford Arsenal, illustrating shells and cases in successive steps of manufacture. Several officers of the arsenal were present at the dinner, including General W. P. Boatwright, commanding officer, and Col. J. Kirk, as well as Col. J. E. Brown, commanding officer of the Delaware Ordnance Depot. A. H. d'Arcambal, national president of the A.S.T.E., was present, as were Conrad O. Hersam, national secretary, and Frank R. Crone, treasurer.

Local arrangements were under the supervision of Paul W. Frankfurter, chairman of the Philadelphia chapter. General floor committee chairman was Charles Crook, Jr. This affair celebrated the third anniversary of the chapter.

Crucible Steel Doubles Earnings in 1940

• • • Crucible Steel Co. of America and subsidiaries show a net profit for 1940 of \$6,230,180 after deductions, as compared with net earnings for 1939 of \$2,803,596. The past year's earnings are equal, after preferred requirements are taken care of, to \$10.24 a share on 445,197 shares of common stock. Net profit for the fourth quarter of 1940 was \$2,859,682 before excess profits taxes were deducted.

OPM Urges Industry To Use More Plastics

Washington

• • • The Office of Production Management was laying increased emphasis on the use of plastics as substitute for certain metals under the defense program last week as Edward R. Stettinius, Jr., Director of Priorities, urged all manufacturers to give immediate attention to the development of plastics in the interest of conserving the supply of metals, particularly aluminum, magnesium and zinc.

An OPM statement directed attention to the necessities of easing the shortages of defense materials, pointing out that the greater use of plastics will "serve to stimulate desirable activity in an industry which has wide opportunities before it."

Suggestions for increasing the use of plastics for both defense and non-defense purposes are to be taken up at a meeting on Feb. 21 in Washington, at which the plastics defense committee of the Society of the Plastics Industry will discuss the industrial plastics with War and Army and Navy officials and other government representatives.

Mr. Stettinius referred to the meeting in his statement and recalled that the Bureau of Standards maintains a plastics section headed by Dr. Gordon Kline. The section, he said, is able to give advice to those manufacturers interested in the possibility of developing plastics to meet problems in their manufacturing processes.

A number of aircraft builders are making elaborate tests to see how and where plastic materials may be used in place of metals, such as aluminum, in cowl covers, engine baffles and flooring, Mr. Stettinius said. Broad attention to the possibility of developing plastics is also being given by automobile manufacturers and by the makers of refrigerators, washing machines, vacuum cleaners, and other household equipment. One project referred to by the OPM statement was said to call for the construction of refrigerator frames entirely of plastics.

New Armco Plant To Include 3 Openhearth

••• American Rolling Mill Co.'s new steel plant at Houston, Texas, consisting of three 100-ton openhearth, a billet and structural mill, rod mill, merchant bar mill, 84-in. plate mill, wire mill and auxiliary equipment, will be managed by Sheffield Steel Corp., an Armco subsidiary, Charles R. Hook, president, says.

"The capacity of the plant (200,000 tons of ingots yearly) will be modest with respect to the total production of products consumed in the area to be served," Mr. Hook said. "This will prevent any disturbance of the normal competitive conditions in the area, and will permit the permanent operation of the plant after the emergency is over."

Wage Adjustments Made At Milwaukee

Milwaukee

••• The Wisconsin Grey Iron Foundry Co. has signed a labor contract with the AFL agreeing to a preferential shop, 5c wage increase and a safeguard of security during war service. The Badger Malleable and Appleton Foundry companies also have signed AFL contracts with wage adjustments for 320 employees.

Settlement of a walkout called Jan. 27 at the T. L. Smith Co. plant has been made on terms "satisfactory to both sides," according to the company officials. A 16-day strike at the Moise Steel Co. also was settled without obtaining the closed shop which was one of the demands but the contract is reported by union officials to be the first the company has ever signed.

The ruling of the National Labor Relations Board that the International Harvester Co. disband its independent unions will affect several thousand local workers and the officials of the Milwaukee local plant union have not decided what action they will take.

American Metal Products Co. employees replaced four AFL unions with an independent union in a Labor Board vote by a four to one vote.

119 New Coke Ovens To Cost \$10 Millions

Pittsburgh

••• Koppers Co. has received contracts for construction of two complete batteries of coke ovens, with by-product recovery equipment. The two awards have a combined value of more than \$10,000,000. The ovens are to be built for the Monessen Coke & Chemical Co. and for the Weirton Steel Co.

The contract for the Monessen Coke & Chemical Co., a subsidiary of the Pittsburgh Steel Co., is for 74 Koppers Becker underjet ovens to be built at Monessen, Pa., adjacent to the blast furnace of the Pittsburgh Steel Co. These ovens will have a total coal carbonizing capacity of approximately 700,000 tons a year (which will make possible an annual production of approximately 525,000 tons of by-product coke).

In addition to the ovens and the coal and coke handling equipment, the contract covers the construction of a new plant for the recovery of tar, benzol, toluol, phenol, and sulphate of ammonia.

The contract for the Weirton Steel Co., a subsidiary of the Na-

tional Steel Corp., covers the construction at Weirton, W. Va., of an additional battery of 45 coke ovens, of the same type as the ovens to be erected at Monessen. These additional ovens will increase the coal carbonizing capacity of the coke plant at Weirton by approximately 400,000 tons a year (which will make possible an annual production of approximately 300,000 tons of by-product coke). They now have 111 Koppers ovens at this plant.

The Weirton contract also calls for the construction of a by-product plant which will handle the throughput of the entire plant, together with the recovery of benzol, ammonia and tar. There will also be extensive changes in the coal and coke handling system.

U. S. Steel's Fair Dioramas Given to Carnegie Tech

U. S. Steel Corp. has given three animated dioramas, representing the chief feature of its New York World's Fair exhibit, to Carnegie Tech for permanent display, Dr. Webster N. Jones, director of Tech's engineering school, announces at Pittsburgh.

SEA FORTS: This structure is one of a ring of sea forts, built of concrete and iron, at strategic points outside the larger British ports. Of recent war photographs this is one of the most unusual.

Photo by Wide World



Four New Bomber Plants for Midwest

Washington

• • • Construction of four new assembly plants to turn out medium and heavy bombers from parts manufactured by automobile plants will start shortly, according to Undersecretary of War Robert P. Patterson. Sites were selected in the Middle West, the War Department having in mind that the bulk of the aircraft industry is concentrated on the East and West coasts.

Contracts for the construction of plants to turn out heavy bombers at Tulsa, Okla., and Fort Worth, Texas, are already being negotiated. This is likewise true of orders for the construction of plants for medium bombers at Omaha, Neb., and Kansas City, Kan.

Biggers, of OPM, Names More Staff Members

Washington

• • • Director of Production John D. Biggers of the Office of Production Management has appointed the following staff members to his division:

Aircraft Section—Merrill C. Meigs, publisher of the *Chicago American* and former director of the defense commission's aeronautical section, has been designated chief of the section. T. P. Wright, former vice-president and chief of research engineering, Curtiss-Wright Airplane Corp., and former defense commission consultant on aviation problems, to be assistant to Mr. Meigs. Maj. E. M. Powers, a graduate of the Air Corps Aeronautical Engineering School, has been assigned by the Air Corps to work with OPM, where his title will be chief of the engineering unit. Dr. A. E. Lombard, author of several technical papers on airplane design and former aeronautical research engineer for the Curtiss-Wright Corp., has been named chief of the production planning unit. A. J. Brandt, consulting engineer and president of the National Tool Co., to be chief of the manufacturing unit.

Ordinance Section—A. R. Glancy, of A. R. Glancy, Inc., Detroit, and

Flush Riveting Used In Lockheed Transport

Burbank, Calif.

• • • One of aviation's first important developments arising out of the war, a new method of riveting in which counter-sunk rivets provide an entirely smooth surface to the streamlined exterior of an all-metal airplane, has entered the commercial field for the first time with the delivery by the Lockheed Aircraft Corp. to Continental Air Lines of the first flush-riveted transports in America.

The planes, the first three of a fleet of Lockheed Lodestars, have gone into service between Denver, headquarters of the air line, and El Paso, Texas, and between Denver and Wichita, Kansas.

"Flush riveting, an outgrowth of Lockheed's flush-riveted Hudson Bombers now in use by the R.A.F., not only gives us 12 mph. more top speed," said Robert F. Six, President of Continental Air Lines, "but to our own surprise and that of Lockheed engineers it also lowers the landing speed 5 mph."

former president of Pontiac Motor Co., to be chief of the section. L. E. Osborne, on leave of absence as manager of *Engineering, Manufacturing and Merchandising* for the Westinghouse Electric & Mfg. Co., to be chief of the artillery, fire control and optical unit. Louis de B. McCrady, retired chief engineer of Canadian Industries, Ltd., and formerly with E. I. du Pont de Nemours Co., to be chief of the explosive artillery, ammunition, and bomb units. E. S. Chapman, on leave of absence from Chrysler Corp., and vice-president of the Plymouth Division, as chief of the small arms and ammunition unit. W. W. Knight, Jr., former assistant general manager of the Michigan Alkali Co., and previously assistant director of the defense commission's tank, truck and tractor section, designated chief of the tank and combat vehicle unit.

Tools Section—Mason Britain, vice-chairman of McGraw Hill Publishing Co., and former head of the defense commission's machine tool section, has been named chief of the tools section and chief of the machine tools unit. Howard Dunbar, vice-president and general manager, machine division, Norton Co., Worcester, Mass., has

been designated technical chief. Alvin B. Einig, general manager of Mott-Merryweather Machinery Corp., to be assistant chief to Mr. Britton.

H. H. Kuhn, president of the Hardware & Supply Co., Akron, Ohio, has been named chief of the mill equipment and supplies unit, a division of the Tools Section. Chief of the heat treating unit will be Bradley Stoughton, Dean of the Department of Metallurgical Engineering, Lehigh University. Sidney Buckley, president, Sheppard Niles Crane Co., has been named chief of the crane unit, another division under the machine tools section.

Work Stoppages At Lackawanna Plant

Buffalo

• • • Labor protests in the form of "work stoppages" among 550 employees in the coke oven department, union workers at the Lackawanna plant of the Bethlehem Steel Co. have occurred periodically for the last week. The men are asking a 25 per cent wage increase and settlement of grievances.

International SWOC Representative Lorne H. Nelles said the workers have been stopping work from 9:30 to 10:30 a.m. and from 1 to 2 p.m. while a grievance committee seeks a conference with the department superintendent.

As result of these demonstrations two blooming mills at the Lackawanna plant have been forced to shut down throwing several hundred men out of work.

Lebanon Steel & Iron Considers Liquidation

• • • Stockholders of Lebanon Steel & Iron Co., Lebanon, Pa., were to vote today (Feb. 20) on liquidation of the company. Increased costs of labor and material were among the reasons given for this action.

Prior to the meeting, the SWOC, through Clinton S. Golden, regional director, offered its services to the company to "increase productive efficiency, eliminate wastes and otherwise reduce costs to save your company from liquidation." Jobs of 650 workmen are involved, the union said. The SWOC sent a list of suggestions on improving efficiency of the Lebanon plant to company officials and to the OPM.

Stettinius Describes Workings Of U. S. Defense Priorities System

Washington

• • • Designed to facilitate the issuance and application of preference ratings, OPM Director of Priorities E. R. Stettinius, Jr., has issued a bulletin covering the entire priorities system.

Henceforth, the Priorities Division will divide administration of the system along practical lines, supplementing its own organization by the available facilities of the two armed services. The Army and Navy Munitions Board, in addition to determining priority ratings on the critical list, as in the past, may by agreement expand the list as the need arises and will also handle the extension of priority ratings down to the first contractor for critical items.

The Priorities Division has authority over priority ratings for all raw materials, for the extensions of ratings below the first subcontractor, over items not on the critical list, over the general field of civilian and commercial needs and over application of the formula to specific cases.

While expressing the hope the affected contractors will cooperate, thus continuing the voluntary system, Mr. Stettinius pointed out that the priority certificates, bearing reference to statutory authority, are mandatory in the sense that they may be enforced, if necessary.

"The President has reposed his statutory powers over priorities in the Office of Production Management and all certificates will go out over the signature of the Director of Priorities," said Mr. Stettinius.

"The Priorities Division will continue its efforts to avoid imposition of mandatory enforcement steps as much as possible. This will be done by working in close cooperation with the Division of Production, with a view toward adjusting production schedules and expanding production to meet arising needs, and with the Division of Purchases, with a view toward finding alternative sources or methods of supply whenever shortages appear."

A prime contractor, Mr. Stetti-

nus said, may make application for extension of his priority rating to a subcontractor if the latter is producing items on which preferential treatment is needed. As to items on the critical list, the prime contractor may obtain extensions

6000 Unset Diamond Dies For U. S. Industry

Washington

• • • Acting upon recommendation of the OPM, the Defense Supplies Corp. has authorized purchase from the British Purchasing Commission of not to exceed 6000 small unset diamond dies, which Director of Priorities E. R. Stettinius, Jr., has announced will be given preferential treatment over all non-defense needs.

Distribution of the dies (to meet a shortage in the wire-drawing industry) will be made by the Defense Supplies Corp. with the assistance of the Priorities Division. Inquiries should be directed to the Defense Supplies Corp., 811 Vermont Ave., N. W., Washington.

of ratings through the Munitions Board and the contracting officers. For items not on this list, he will seek relief from the Priorities Division.

Pointing out that the priorities certificate is to be used only when an alternative solution is not available, Mr. Stettinius said that the Priorities Division will attempt to obviate the use of priorities wherever possible. This, it was stated, will be done by working in close collaboration with the Division of Production with a view to adjusting production schedules and through the Division of Purchases with a view to finding alternative sources of supply.

The order of preference is indicated by the following symbols: In order of preference AA, which is reserved for emergencies of an exceptional nature; A-1-a, A-1-b, A-1-c . . . , A-1-j; A-2, A-3 . . . , A-10. As between contracts and orders in the same subdivision (as A-1-c), except as otherwise specifically re-

quested by the Director of Priorities, the date of delivery contracted for will determine the order of precedence.

Under the direction of the Army and Navy Joint Board, the Army and Navy Munitions Board will determine the relative importance of military items, such as guns, tanks, airplanes, ammunition, etc. Then contracting officers of the Army and Navy, coordinated by the Munitions Board, will administer the assignment of preference ratings to prime contracts for a selected list of critical items. The contracting officers will also approve the extension of the preference rating assigned the prime contract for the first subcontract if the latter provides for production of items on the critical list.

The Munitions Board will also, upon application of the contracting officer or prime contractor, assign preference ratings in the same manner to prime contracts placed by certain other governmental agencies for equipment deemed essential to the defense program. Such agencies now include the Maritime Commission, Coast and Geodetic Survey, Coast Guard and National Advisory Committee for Aeronautics.

The OPM Priorities Division will be responsible for the determination of preference ratings on all items below the first subcontract including all raw materials.

Discussing the procedure in making application for the two kinds of contracts—(1) prime army or navy, and (2) all other—the Stettinius statement, dealing with the first kind, said ratings will be assigned by the contracting officers with respect to direct Army and Navy procurement. If a priority rating has not been obtained at any time by a government supplier and he believes that a rating is necessary, he may request that a certificate be issued by the contracting officer or inspector with whom he is in contact.

If the prime contractor wishes that this rating be extended to his subcontractors, he should ask the Army or Navy inspector, or contracting officer, to fill out a priorities certificate. The Army or Navy official, it was stated, will only approve such an extension if the item from the first subcontractor is on the critical list.

Canada Lifts Ban On Auto Imports

Toronto

• • • New orders for finished and semi-finished steel are appearing in heavy volume and producers have reached the stage where delivery dates, on fresh contracts, are somewhat uncertain, being anywhere from four months on merchant bars to six or seven months on sheets, while on plate all present Canadian output has been fully contracted for the remainder of the year.

The flow of new orders is said to be in excess of present plant production. War priorities are giving those industries engaged in war work a decided advantage over ordinary business and the latter interests are receiving deliveries only when there is a surplus over the pressing needs of war plants. Some branches of the war industry, however, have felt the pinch and on a number of occasions recently production lines have been forced to slow down pending arrival of steel supplies. Steel demands are widely diversified. In addition to the big commitments with Canadian mills, large tonnage contracts still are going to United States producers, averaging better than 70,000 tons per month. Canadian mill officials do not look for price changes in the early future, current quotations being practically the same as those prevailing a year ago.

Construction work will be started immediately by Dominion Bridge Co., Ltd., Lachine, Que., on a large drydock in Eastern Canada, to cost about \$3,000,000. It will not be completed until 1942. The drydock will be of the most modern and improved design, so as to handle big ships, but not the largest ships in the British Navy.

Finance Minister Ilsley announced that the government has appointed John H. Berry motor vehicle controller to safeguard war production against civilian demands for automobiles. He stated that total prohibition of importation of new passenger cars, imposed in the War Exchange Conservation Act last December, would be lifted and a limited number of imports allowed on a quota basis under permit. The quota for

the quarter ending March 31 next will be 20 per cent of the value of cars imported on the average of imports for the same quarters of 1938, 1939 and 1940. Firms not producing cars in Canada prior to December 2, 1940, will not be permitted to produce more cars than they could obtain under the import quotas.

C. D. Howe announced that Canadian shipyards to date have launched 45 corvettes and 11 mine-

Herbert Emmerich OPM Secretary

Washington

• • • Herbert Emmerich, lecturer on political science at the University of Chicago and former deputy governor of the Farm Credit Administration, has been named Secretary of the Office of Production Management. A graduate of the Wharton School of Finance and Commerce in 1918, Mr. Emmerich has held several government positions since 1933. For the last three years he has been associate director of the Public Administration Clearing House in Chicago.

sweepers and an additional 14 corvettes and 18 minesweepers will be launched in May. From its inception Canada's shipbuilding program includes 60 corvettes for the Canadian Navy and 18 for the British Navy; 38 minesweepers for the Canadian Navy and 12 for the British; 10 wooden minesweepers for the British Navy; 20 Fairmile boats for the Canadian Navy; 20 merchant vessels of about 9300 tons for the British Government, as well as a number of small craft.

Willys to Use Less Zinc in Car Parts

Toledo, Ohio

• • • A reduction in the use of zinc in strictly ornamental car parts will be made by Willys-Overland Motors, Inc., in order to assist the national defense program, it is understood. On the basis of its present large output of automobiles, an appreciable saving of zinc will be afforded.

New England Builds 167 Warships for U. S.

• • • One hundred and sixty-seven fighting ships, valued at \$1,122,391,000, are under construction or in pre-construction stages at 10 New England shipyards, according to a survey by the New England Council. Eight of these yards are privately owned, and two are operated by the Navy Department.

Private shipyards are constructing 127 ships valued at \$916,666,000, while the Boston and Portsmouth Navy yards are building 40 ships valued at \$205,725,000.

The value of the contracts, with the number and type of ships being constructed at private yards are as follows:

Maine: Bath Iron Works Corp., Bath, 31 destroyers and cargo ships valued at \$184,914,000.

Bristol Yacht Building Co., two mine sweepers valued at \$300,000.

Snow Shipyards, Inc., Rockland, four mine sweepers valued at \$600,000.

Massachusetts: Bethlehem Steel Co., Quincy, 29 cruisers, battle-ships and destroyers valued at \$599,477,000.

George Lawley & Sons Corp., Neponset, 10 sub-chasers valued at \$4,500,000.

W. A. Robinson, Inc., Ipswich, four mine sweepers valued at \$632,000.

Rhode Island: Herreshoff Mfg. Co., Bristol, two mine sweepers valued at \$304,000.

Connecticut: Electric Boat Co., Groton, 45 submarines valued at \$125,939,000.

Government Yards: Navy Yard, Boston, 23 destroyers and tenders valued at \$134,993,999.

Navy Yard, Portsmouth, N. H., 17 submarines valued at \$70,732,000.

Open Web Steel Joist Standards Reaffirmed

Washington

• • • Reaffirmation of the simplified schedule of sizes for open web steel joists, originally effective in 1930 and reaffirmed without change in 1933, 1935 and 1937, has been announced by the Bureau of Standards.

Government Puts Price Ceiling On Second-hand Machine Tools

Washington

••• A formal order fixing maximum prices on second-hand machine tools was issued by the National Defense Advisory Commission early this week in an initial move that will be extended to include other products where necessary to "protect the public interest and guard against profiteering." To become effective March 1, the pricing provision included a schedule of maximum prices in terms of percentages of current list price of equivalent new machine tools.

The order was signed by Leon Henderson, head of the price stabilization division. It represents the first time that instructions from any of the government's defense agencies have taken the form of an administrative order. The prescribed penalties for violations included (1) the threat that Congress and the public will be fully informed of instances of profiteering or non-cooperation; and (2) an additional threat that the powers of government will be fully exerted in order to protect the public interest in the maintenance of fair prices.

The price schedules, the result of information supplied by the trade and of independent investigation by government experts, were found by Mr. Henderson "to constitute reasonable limitations on prices for second-hand machine tools." In a letter sent to second-hand machine tool dealers, Mr. Henderson drew a distinction between maximum prices or "ceiling prices" covered by the order and minimum or fixed prices, emphasizing that sales may and should be made below the "ceiling."

The price limitations vary with the age of the second-hand machine tool according to the accompanying table.

The price order calls for the filing of reports on machine tools in stock, tools sold by dealer either as principal or agent, and tools bought by the dealer as agent for a purchaser. Reports on tools in stock, which may be in the form of circulars or stock sheets, are to be filed weekly. The first reports are

Date of Manufacture	Condition	Maximum price in terms of percentage of current list price of equivalent new machine tool
1. Jan. 1, 1936 and after	(a) Rebuilt and guaranteed	95
	(b) Others	75
2. Jan. 1, 1930, to Dec. 31, 1935	(a) Rebuilt and guaranteed	90
	(b) Others	70
3. Jan. 1, 1920, to Dec. 31, 1929	(a) Rebuilt and guaranteed	80
	(b) Others	60
4. Before Jan. 1, 1920	(a) Rebuilt and guaranteed	70
	(b) Others	50

due to be filed with the defense commission during the first week of Feb. 24. Reports on transactions are to be filed monthly starting in April. Printed forms are being prepared and will be ready for distribution shortly. Tools offered or sold for less than \$500 do not have to be covered in the required reports. The monthly report seeks data on the date of sale; type of machine; make; size; serial number; date of manufacture; price received by seller; list price of equivalent new machine; and remarks.

Dealers finding difficulty in understanding the schedule or the necessary reports were urged to communicate with the Price Stabilization Division. Dealers who find the schedule works a hardship on them also were urged to write Mr. Henderson.

Reasons advanced for the fixing of maximum prices included the difficulty of maintaining price stability in the absence of any maximum price standards, and the uncovering of cases where, Mr. Henderson said, tools bought 30 years ago are being priced at twice the original cost. It was indicated that the entire machine tool price structure was being threatened, disastrous price inflation was in the offing, and undue burdens were being placed on the defense effort as a result of a situation which finds in many instances the price for second-hand tools higher than current prices for new ones.

"Prices in the second-hand ma-

chine tool trade have risen until they have become out of line, especially as compared with prices for new machine tools," Mr. Henderson said in his letter to dealers. "That condition is definitely harmful to the defense program. This division cannot allow it to continue further. Most if not all of the persons trading in second-hand machine tools agree with that conclusion. The Price Stabilization Division has accordingly issued Price Schedule No. 1."

TNEC Holds Larger Steel Buyers Favored

Washington

••• Consisting of 50 pages of which 33 are devoted to tables and charts, the long-delayed TNEC monograph on "Price Discrimination in Steel," just released, attempts to show that in normal times the larger the buyer, the lower the price. It is reported that the basing point will be treated in a concluding monograph (prepared by the FTC) which unlike the present one on steel will carry recommendations.

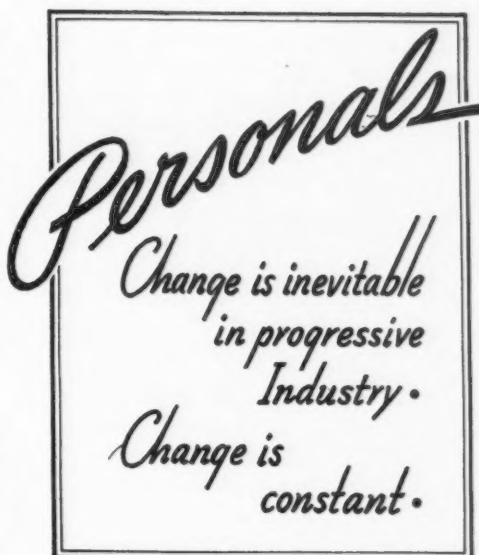
The monograph on "Price Discrimination in Steel" was prepared by John M. Blair and Arthur Reesdale.

Mr. Reesdale and Mr. Blair prefaced their monograph in an apologetic tone. They admit that "certain assumptions had to be made; certain irregularities were found to exist in graphic curves; and therefore no claim is made to statistical perfection." In part a progress report made to the TNEC by Executive Secretary Dewey Anderson, outlined in THE IRON AGE of Jan. 23, was a preview of the Blair-Reesdale monograph.

The monograph said that the most significant phase of the study is the size of price concessions granted. It declared that in the case of those steel products consumed in considerable part by a small number of large buyers, the price concessions to big purchasers may account for as much as 50 per cent. In the case of those products sold mainly to many relatively small buyers, it was declared, the decline in price is much less.

• **Dr. Paul D. Merica**, assistant to the president of the International Nickel Co., New York, received a platinum medal from the council of the Institute of Metals in Great Britain in recognition of "distinguished services to non-ferrous metallurgy" for his origination of the "precipitation theory" of hardening developed in connection with research on aluminum alloys. The presentation was made at the British Embassy in Washington recently.

• **Kenneth C. Plasterer** has been named manager of the General Motors forge plant, Lansing Township. He succeeds **George Motherwell**, resigned. Mr. Plasterer joined Olds Motor works in 1927 in the engineering department, serving as production engineer until 1929 when he was transferred to the Muncie products division at Muncie, Ind., as assistant to the general manager. He was returned to Lansing in 1932 as special engineer at Olds. In 1932 he was made production engineer and later in the same year he became chief inspector, in which position he remained until last July when he was assigned to special engineering work in connection with the national defense program. Previous to his connection with Oldsmobile he served an apprenticeship in the Warren Ma-



chine Co. and was employed in production and engineering capacities by Maxwell Motor Car Co., Premier Motor Co., American Die-casting Co. and Delco-Remy division of General Motors Corp.

• **Richard A. Geuder** has been made manager of metal industry applications for Reliance Electric & Engineering Co., Cleveland. Mr. Geuder obtained his B.S. in electrochemical engineering from Pennsylvania State College in 1929. He went directly to Reliance upon graduation and has been engaged in application engineering

work for the company uninterruptedly since that time.

• **F. J. Burt**, heretofore superintendent of wire and wire products of Donora works of American Steel & Wire Co., has been appointed assistant director of industrial relations, with headquarters in Cleveland. **J. E. Kelley**, since 1936 assistant director of industrial relations, has been made field supervisor, labor relations, and **J. W. Carothers** has been appointed personnel supervisor. Mr. Carothers has been identified with the company since 1916, for the past two engaged in the company's executive personnel program. **Earl H. Dick**, who has been plant metallurgist at Donora, has been made superintendent of wire and wire products at that plant.

• **Tom Towle** has been named head of the aeronautical engineering section of the aircraft division of Hudson Motor Car Co. He is widely known in aeronautical engineering circles, having been identified for the past 20 years with major producers in the aircraft industry as well as operating his own company at one time. He is a graduate of Sheffield Scientific School of Yale University. His headquarters will be in the regular engineering building



KENNETH C. PLASTERER, manager of the forge plant in Lansing Township of General Motors Corp.



RICHARD A. GEUDER, manager of metal industry applications for Reliance Electric & Engineering Co.



TOM TOWLE, head of the aeronautical engineering section of the aircraft division of Hudson Motor Car Co.

at the Hudson plant in Detroit. Mr. Towle designed and built in Detroit nearly a decade ago the first all-metal amphibian.

- **W. D. Preston**, of the steel boiler division of the Oil City Tank & Boiler Co., Oil City, Pa., has been appointed assistant to the vice-president in charge of sales. He will be in charge of the company's 70 sales offices and will also act as special government agent for the company.

- **L. F. Supple**, formerly president of the Springfield Glazed Paper Co., has joined the Reynolds Metals Co., New York, as head of the Unifoil division.

- **Carl W. Coslow**, formerly mechanical superintendent of the Hamilton Watch Co., Lancaster, Pa., will join the executive staff of the Lockheed Aircraft Corp., Burbank, Cal., effective March 1.

- **Edward Coates**, formerly superintendent of the electrical department of the Buffalo works of Republic Steel Corp., and later employed in a similar capacity with Steward & Lloyd, Ltd., Corby, England, has been appointed superintendent of the electrical and mechanical department for Barium Stainless Steel Corp., Canton, Ohio.

- **E. S. Weaver** has joined the wire rope sales division of Jones & Laughlin Steel Corp., with headquarters at Tulsa, Okla. Mr. Weaver was previously associated for 12 years with John A. Roebeling's Sons Co.

- **Roy Porter**, chairman of the board of the Marshall-Huschart Machinery Co., Chicago, and **Charles E. Moore**, president of the Moore Machinery Sales Co., Los Angeles and San Francisco, have taken up their duties in Washington as assistant chiefs of technical section of the OPM's Machine Tool Division.

- **Thomas H. Jones**, attorney, has been elected a director of the Warner & Swasey Co., Cleveland.

- **John F. Van Nort**, heretofore identified with the Pittsburgh plant of the Duff-Norton Mfg. Co., has been appointed sales manager, Western division, with headquarters in the Peoples Gas Building, Chicago. **Alex S. Anderson** continues as district manager.

- **Abe Cohen**, of the Fort Pitt Tool & Supply Co., Pittsburgh, has been made chairman of the committee on arbitration of the Institute of Scrap Iron and Steel, Inc. **David Feinburg**, of the company of the same name, Medford, Mass., has been named vice-chairman. **Hiram Winternitz**, of Charles Dreifus Co., Philadelphia, has been appointed chairman of the export committee of the institute, and **Louis Dulien**, of Dulien Steel Products Co., Seattle, has been named vice-chairman.

- **Fairman B. Lee** has been appointed representative for the Ajax Electric Co., Philadelphia, for Washington, Oregon, northern Idaho, and western Montana, with headquarters at 166 Jackson Street, Seattle.

- **Frank J. Oliver**, machine tool editor of THE IRON AGE, was elected chairman of the New York-New Jersey Chapter of the American Society of Tool Engineers at the February meeting held at Newark, N. J. Other officers of the local chapter elected at the same time were: First vice-chairman, **Stanley A. Gruchacz**, foreman of toolroom, Monroe Calculating Machine Co., Inc.; second vice-chairman, **Remo Rege**, manager of production engineering department, Wright Aeronautical Corp.; treasurer, **Frank L. Delhagen**, supervisor of tool inspection, Western Electric Co., and secretary, **Ben C. Brosheer**, assistant editor, *American Machinist*. This chapter, second largest of 38 in the society, has a membership of over 400.

- **G. H. Bell** has become assistant general manager of Willys-Overland Motors, Inc., Toledo, and **William Truitt** has been placed in charge of the export business.

- **L. G. Parker** has relinquished his official duties as president and treasurer, Cleveland Frog & Crossing Co., Cleveland, but will remain on the directorate as representing the estate of George C. Lucas, one of the company's founders. Mr. Parker has been connected with the corporation and the previous partnership in various capacities for 32 years.

- **L. E. Connelley** has been elected president, **G. A. Peabody**, vice-president, **F. P. Norman**, treasurer and **L. C. Spieth**, secretary.

- **Ralph Budd**, president of the Chicago, Burlington & Quincy Railroad and transportation member of the National Defense Advisory Commission, has received the Washington Award for 1941. The distinction was conferred upon Mr. Budd for "vision and courageous leadership in advancing the technological frontiers of high speed railroad transportation."

- **William Weimer**, for a number of years identified with Davis & Thompson Co., Milwaukee, retains his position as vice-president and will be associated with **M. W. Rogers**, the new president, in future enterprises.

- **Donald S. McKenzie**, who has been identified with General Electric Co. for over 10 years, for the past two with the sales department of the Nela Park branch, has been made sales manager of the plastics department, with office at Pittsfield, Mass. He succeeds **W. H. Milton, Jr.**, recently named assistant manager of the department.

- **Robert L. deLoache**, for the past 14 years superintendent of the switchboard department of the Atlanta plant of Westinghouse Electric & Mfg. Co., has been appointed manager of the Philadelphia switchboard plant.

- **John E. Keyes**, who has been transferred from the main plant of Hanson - VanWinkle - Munning Co., Matawan, N. J., has assumed his duties as representative in the company's Detroit office. **William J. Wise**, for many years associated with the finishing department of the National Cash Register Co., has joined the Hanson-VanWinkle company sales organization in the newly-opened office in Dayton. **Robert M. Norton**, after a period of training in Matawan, has been assigned to work with **H. A. Todd**, representative in Syracuse, N. Y. **J. MacDonald Smith**, for many years president of the Kabushiki Kaisha A. P. Munning Co., Kobe, Japan, has returned to the United States and has joined the company as export manager, with headquarters at 30 Church Street, New York. **O. Waring Mellick**, sales representative in the main office at Matawan, has been transferred to the Bridgeport, Conn., office. **John VanderVoort** has been transferred from the duties of direct sales rep-

representative in up-state New York to special duties in the main office at Matawan.

- **Charles T. Ramsden**, for the last 27 years consulting engineer for the Beloit Iron Works, Beloit, Wis., has been elected a vice-president. He started to work for the firm 45 years ago as a machinist, later became an erector and field representative before entering the sales division.

- **W. H. Biggert**, vice-president and director of the J. I. Case Co. for the last 14 years, has resigned to do some special work he has been planning for some time. He started in the farm machinery manufacturing business in 1910 with the Deering works of International Harvester Co.

- **Col. G. F. Jenks**, Washington, D. C., president of the American Welding society, told the Milwaukee chapter of his organization that military equipment such as gun carriages and tanks have been made measurably lighter and stronger through the use of welding instead of riveting or casting.

- **Thomas Bentley**, head of A. Bentley & Sons Co., Toledo, has been named chairman of a construction advisory board to assist the defense program in the Fifth Corps area, with headquarters at Columbus, Ohio.

- **H. A. Porter**, vice-president in charge of sales of Harris-Seybold-Potter Co., Cleveland, was honored at a company banquet in Hotel Hollenden, Cleveland, Feb. 1, on his 25th anniversary with the company.

- **George Sherman**, formerly with the mechanical rubber goods division of U. S. Rubber Co., has become associated with Wolverine Fabricating & Mfg. Co., Inc., Detroit, as sales engineer. At the same time **Paul Curran**, formerly sales engineer, has been placed in charge of the development laboratory and product control. **Al Finn**, formerly of the Chrysler laboratory, is rubber chemist with **Claude Abeel**. The Wolverine company manufactures non-metallic gaskets, gasket materials, seals, packings and fabricated parts.

- **Hugh E. Replogle**, formerly associated with Crucible Steel Co. of America, has joined the Universal-Cyclops Steel Corp., Bridgeville, Pa., in a general tool steel

sales capacity. He will make his headquarters at the Cyclops division at Titusville, Pa.

- **L. W. Haag** has been appointed representative in Michigan and Illinois for Heil & Co., Cleveland. **William M. Parkin Co.**, Pittsburgh, has been appointed to cover Pennsylvania and the East, and **Joseph Bean**, of Warren, Ohio, to cover Ohio.

- **E. W. Petersen**, of the American Blower Co., has been elected president of the Propeller Fan Manufacturers Association, Detroit, and **A. R. Stephan**, of the DeBothezat Ventilating Equipment Co., vice-president.

- **G. R. Folds** has been elected chairman of the board of the Cook Electric Co., Chicago. **W. C. Hasselhorn** has been made president; **J. S. Baker**, vice-president, and **C. E. Lundeen**, secretary-treasurer.

- **Clarence B. Tilton** has been elected vice-president in charge of production of the Safety Grinding Wheel & Machine Co., Springfield, Ohio.

- **Walter Erman**, of Erman-Howell & Co., Inc., Chicago, has been made chairman of the committee on public relations and research of the Institute of Scrap Iron and Steel. **Charles Dreifus, Jr.**, of Dreifus Iron & Steel Corp., New York, has been named vice-chairman.

- **E. H. Erickson** has been elected president of Safticycles, Inc., La Crosse, Wis., to succeed **C. R. Pieper**, who has moved to St. Louis. **E. A. Chinander** will succeed Mr. Pieper as a director.

- **Kenneth F. Ode**, former personnel manager who has been with the Falk Corp., Milwaukee, since 1934, has been promoted to supervisor of plant maintenance, to succeed **A. D. Rea**.

- **Maxwell C. Maxwell**, assistant to the president, Yale & Towne Mfg. Co., was the speaker at the recent meeting of the Milwaukee section, American Society of Mechanical Engineers held in the Marquette University.

- **P. K. Povlsen**, South Orange, N. J., has been appointed assistant to President Leon R. Clausen of the J. I. Case Co., Racine, Wis. Mr. Povlsen formerly was an engineer with American Telephone & Telegraph Co.

Obituary

- **Henry J. Eltz**, since 1925 works superintendent of Brown & Sharpe Mfg. Co., Providence, died at the Jane Brown Hospital in that city on Jan. 31, aged 58 years. He joined the screw manufacturing department of the company in 1904 and two years later was made subforeman. In 1911 he was transferred to the inspection department and nine years later took charge of the new industrial project of training workers.

- **E. M. S. Young**, formerly an official of the old Superior Steel Co., at Carnegie, Pa., now the Superior Steel Corp., died recently at his home in San Diego.

- **Ralph S. Richards**, for many years purchasing agent for the Atlas Car & Mfg. Co., Cleveland, died Feb. 6, aged 60 years.

- **William Bertell Carter**, former president of Globe Foundry & Machine Co., Niles, Ohio, died Feb. 3 in Cleveland, aged 83 years.

- **Thomas R. Barnes**, 78, retired pump manufacturer, died Jan. 31 in Toledo, Ohio. Mr. Barnes organized the Barnes Mfg. Co., Mansfield, Ohio, in 1887, and was its president until he retired.

- **Lorenzo T. Clarke**, 76, former superintendent of the King Bridge Co., Cleveland, died Feb. 2 in St. Louis. Leaving Cleveland 25 years ago, he was connected with a St. Louis engineering company.

- **James Slocum O'Rourke**, vice-president and treasurer of the Michigan Seamless Tube Co., South Lyon, Mich., died Jan. 30 at his home in Birmingham, Mich. Mr. O'Rourke was 54 years old.

- **Willard M. Clapp**, Cleveland industrialist who in 1893 became associated with the Cleveland Foundry Co., which later became part of the Perfection Stove Co., died Jan. 31 at the age of 82.

- **William Hammann**, head of the William Hammann Sheet Metal Works, Milwaukee, and active in the sheet metal trade for more than 50 years, died Feb. 5 at his home in Milwaukee, aged 72. He had been in ill health for several years.

The Iron Age Comparison of Prices

Advances Over Past Week in Heavy Type; Declines in Italics

	Feb. 18 1941	Feb. 11 1941	Jan. 21 1941	Feb. 20 1940		Feb. 18 1941	Feb. 11 1941	Jan. 21 1941	Feb. 20 1940
Flat Rolled Steel:					Pig Iron:				
(Cents Per Lb.)					(Per Gross Ton)				
Hot rolled sheets.....	2.10	2.10	2.10	2.10	No. 2 fdy., Philadelphia..	\$25.84	\$25.84	\$25.84	\$24.84
Cold rolled sheets.....	3.05	3.05	3.05	3.05	No. 2, Valley furnace....	24.00	24.00	24.00	23.00
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50	No. 2, Southern Cin'ti....	24.06	24.06	24.06	23.06
Hot rolled strip.....	2.10	2.10	2.10	2.10	No. 2, Birmingham.....	19.38	19.38	19.38	19.38
Cold rolled strip.....	2.80	2.80	2.80	2.80	No. 2, foundry, Chicago†.	24.00	24.00	24.00	23.00
Plates	2.10	2.10	2.10	2.10	Basic, del'd eastern Pa...	25.34	25.34	25.34	24.34
Tin and Terne Plate:					Basic, Valley furnace....	23.50	23.50	23.50	22.50
(Dollars Per Base Box)					Malleable, Chicago†	24.00	24.00	24.00	23.00
Tin plate	\$5.00	\$5.00	\$5.00	\$5.00	Malleable, Valley	24.00	24.00	24.00	23.00
Manufacturing ternes ...	4.30	4.30	4.30	4.30	L. S. charcoal, Chicago..	30.34	30.34	30.34	30.34
Bars and Shapes:					Ferromanganese‡	120.00	120.00	120.00	100.00
(Cents Per Lb.)					†The switching charge for delivery to foundries in the Chicago district is 60c. per ton. ‡For carlots at seaboard.				
Merchant bars	2.15	2.15	2.15	2.15	Scrap:				
Cold finished bars.....	2.65	2.65	2.65	2.65	(Per Gross Ton)				
Alloy bars	2.70	2.70	2.70	2.70	Heavy melt'g steel, P'gh.	\$21.00	\$20.75	\$21.50	\$17.25
Structural shapes	2.10	2.10	2.10	2.10	Heavy melt'g steel, Phila.	20.00	20.00	20.00	17.25
Wire and Wire Products:					Heavy melt'g steel, Ch'go	19.25	19.25	19.75	15.625
(Cents Per Lb.)					Carwheels, Chicago	20.25	20.25	20.75	17.25
Plain wire	2.60	2.60	2.60	2.60	Carwheels, Philadelphia .	23.00	23.00	23.00	20.25
Wire nails	2.55	2.55	2.55	2.55	No. 1 cast, Pittsburgh...	22.25	22.25	22.00	18.25
Rails:					No. 1 cast, Philadelphia.	23.75	23.75	23.75	20.25
(Dollars Per Gross Ton)					No. 1 cast, Ch'go (net ton)	19.25	19.25	18.75	14.25
Heavy rails	\$40.00	\$40.00	\$40.00	\$40.00	Coke, Connellsville:				
Light rails	40.00	40.00	40.00	40.00	(Per Net Ton at Oven)				
Semi-Finished Steel:					Furnace coke, prompt...	\$5.50	\$5.50	\$5.50	\$4.00
(Dollars Per Gross Ton)					Foundry coke, prompt...	5.75	5.75	5.75	5.25
Rerolling billets	\$34.00	\$34.00	\$34.00	\$34.00	Non-Ferrous Metals:				
Sheet bars	34.00	34.00	34.00	34.00	(Cents per Lb. to Large Buyers)				
Slabs	34.00	34.00	34.00	34.00	Copper, electro., Conn.*..	12.00	12.00	12.00	11.50
Forging billets	40.00	40.00	40.00	40.00	Copper, Lake, New York.	12.00	12.00	12.00	11.50
Wire Rods and Skelp:					Tin (Straits), New York.	51.75	50.25	50.15	46.00
(Cents Per Lb.)					Zinc, East St. Louis.....	7.25	7.25	7.25	5.50
Wire rods	2.00	2.00	2.00	2.00	Lead, St. Louis	5.50	5.50	5.35	4.85
Skelp (grvd)	1.90	1.90	1.90	1.90	Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 111-120 herein. On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Composite Prices

FINISHED STEEL				PIG IRON				SCRAP STEEL			
Feb. 18, 1941.....	2.261c. a Lb.....			\$23.45 a Gross Ton.....				\$20.08 a Gross Ton.....			
One week ago.....	2.261c. a Lb.....			\$23.45 a Gross Ton.....				\$20.00 a Gross Ton.....			
One month ago.....	2.261c. a Lb.....			\$23.45 a Gross Ton.....				\$20.42 a Gross Ton.....			
One year ago.....	2.261c. a Lb.....			\$22.61 a Gross Ton.....				\$16.71 a Gross Ton.....			
High		Low		High		Low		High		Low	
1941.....											
1940.....	2.261c., Jan. 2	2.211c., Apr. 16		\$23.45, Dec. 23	\$22.61, Jan. 2			\$22.00, Jan. 7	\$20.00, Feb. 11		
1939.....	2.286c., Jan. 3	2.236c., May 16		22.61, Sept. 19	20.61, Sept. 12			21.83, Dec. 30	16.04, Apr. 9		
1938.....	2.512c., May 17	2.211c., Oct. 18		23.25, June 21	19.61, July 6			22.50, Oct. 3	14.08, May 16		
1937.....	2.512c., Mar. 9	2.249c., Jan. 4		23.25, Mar. 9	20.25, Feb. 16			15.00, Nov. 22	11.00, June 7		
1936.....	2.249c., Dec. 28	2.016c., Mar. 10		19.74, Nov. 24	18.73, Aug. 11			21.92, Mar. 30	12.92, Nov. 10		
1935.....	2.062c., Oct. 1	2.056c., Jan. 8		18.84, Nov. 5	17.83, May 14			17.75, Dec. 21	12.67, June 9		
1934.....	2.118c., Apr. 24	1.945c., Jan. 2		17.90, May 1	16.90, Jan. 27			13.42, Dec. 10	10.33, Apr. 29		
1933.....	1.953c., Oct. 3	1.792c., May 2		16.90, Dec. 5	13.56, Jan. 3			13.00, Mar. 13	9.50, Sept. 25		
1932.....	1.915c., Sept. 6	1.870c., Mar. 15		14.81, Jan. 5	13.56, Dec. 6			12.25, Aug. 8	6.75, Jan. 3		
1931.....	1.981c., Jan. 13	1.883c., Dec. 29		15.90, Jan. 6	14.79, Dec. 15			8.50, Jan. 12	6.43, July 5		
1930.....	2.192c., Jan. 7	1.962c., Dec. 9		18.21, Jan. 7	15.90, Dec. 16			11.33, Jan. 6	8.50, Dec. 29		
1929.....	2.236c., May 28	2.192c., Oct. 29		18.71, May 14	18.21, Dec. 17			15.00, Feb. 18	11.25, Dec. 9		
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.				Based on averages for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.				Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.			

Summary of the Week

VARIOUS steps that have been taken in the past few days at Washington tend to tighten the controls which government bureaus are exercising over industry in furtherance of the national defense effort.

Most important, perhaps, is in the direction of price controls. A formal order fixing "ceiling" prices on second-hand machine tools, issued by the National Defense Advisory Commission, is a stronger step toward government price control than has previously been taken. It foreshadows similar action in other products where necessary "to protect the public interest and guard against profiteering."

A ruling on prices and priorities by Assistant Attorney General Thurman Arnold, while declaring that business men are not guilty of conspiracy under the anti-trust laws if they take certain action at the direction of a government bureau, places the responsibility of "giving the necessary directions in price and priority matters by doing it in public, in the open, so that the directions are constantly subject to public examination."

This ruling may clarify an issue between the Price Stabilization Division of the National Defense Commission and the scrap industry with regard to the fixing of price differentials as between districts and grades on iron and steel scrap. The industry has sidestepped the fixing of such differentials because of fear of the anti-trust laws, though the need for such differentials has become imperative if the scrap stabilization program is to work. It may be inferred from the Arnold ruling that such price differentials should be established by the Defense Commission.

IN the issuance of new priority regulations, the director of priorities has specified, for the first time, that priority certificates, bearing reference to statutory authority, are "mandatory," although the voluntary system will be followed so far as is practicable. The Army and Navy Munitions Board will issue priorities for military needs, while the priorities board will administer the wider field of general industrial and civilian needs and also raw materials. Furthermore, priority ratings will henceforth be given to sub-contractors. Other than for Army and Navy needs, the use of priorities will be limited so as to interfere as little as possible with private activity.

Congestion of orders at steel mills is forcing steel companies to put into effect more rigid controls of their own devising. Some recent inquiries have shown an astonishing gain over normal takings, and in such cases steel companies are insisting that they be scaled down. Inquiries for third quarter are in many instances larger than the orders placed for second quarter.

• Government controls becoming more apparent . . . Strongest step toward price fixing is in second-hand machine tools . . . Priorities are now "mandatory" where statutory authority is cited, but voluntary cooperation will be used so far as possible . . . Strikes and breakdowns affect output.

While most of the steel companies continue to show a satisfactory record in keeping delivery promises, the use of a greater number of preference ratings is beginning to have a more marked effect on schedules. Loss of steel production has resulted in the past week from strikes and mill breakdowns. A strike at the Brier Hill plant of Youngstown Sheet & Tube Co., settled last Saturday after several days' suspension, caused a loss of output, while work stoppages at the coke ovens of the Bethlehem Steel Co. at Buffalo, brought about by workers who demand a 25 per cent wage increase, resulted in the shutting down of two blooming mills. A loss of three and a half points in the Chicago district ingot rate this week resulted from the breakdown of a blooming mill at a large plant. This week's industry rate is computed at 96 per cent.

THE piling up of steel orders has occurred despite the fact that British orders recently have been lower than in recent months. However, when the Lend-Lease Bill has been passed an avalanche of new orders is expected which may cause considerable disruption in mill schedules.

The substitution of other materials, particularly plastics, for such scarce metals as aluminum, magnesium and zinc, has been recommended by the Office of Production Management. The scarcity of zinc is forcing steel companies to restrict sales of galvanized sheets and other galvanized items, but meanwhile the Army is seeking a large number of cots and water pails of galvanized steel where enameled products probably would serve as well.

A tight situation in structural steel was the subject of a meeting in New York last week. Measures will be taken to expedite essential requirements during the next few months, it being the opinion of the trade that the demand for this product will decline by summer.

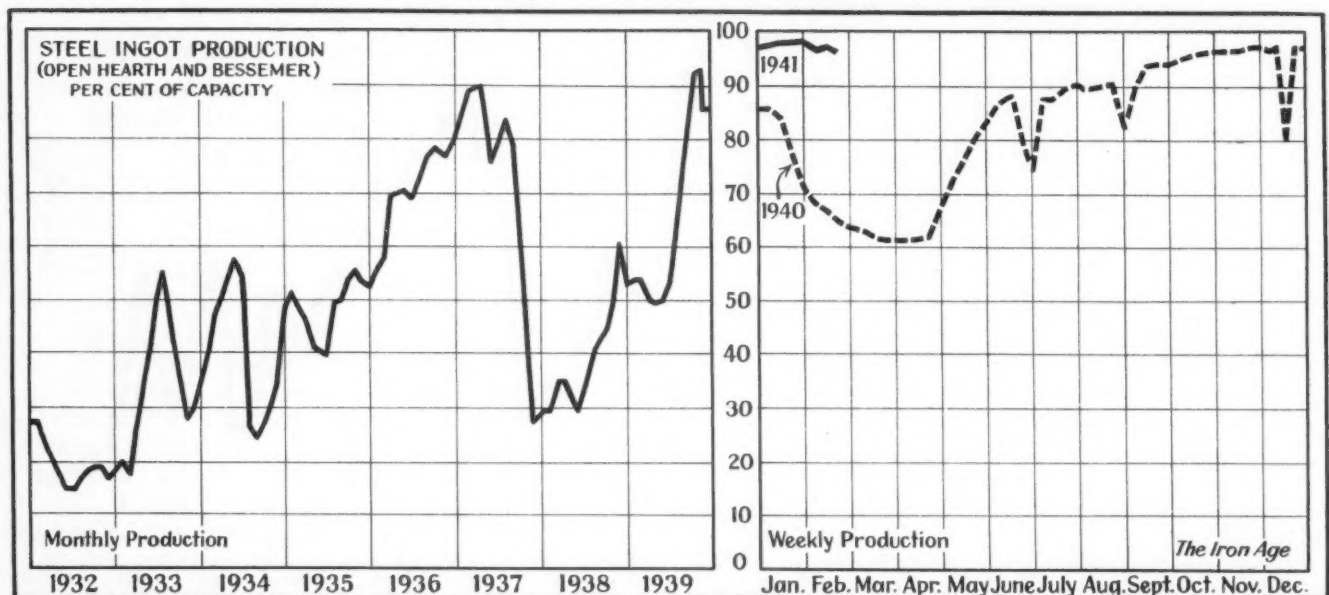
Steel scrap prices tend to recede, though an adjustment at Pittsburgh has raised THE IRON AGE steel scrap composite 8c. to \$20.08. Cast grades are scarce and tend toward higher prices.

The Industrial Pace . . .

DECLINES in four of the five components of THE IRON AGE index of capital goods activity in the past week lowered the index to 124.0, a five weeks' low. In the preceding week the index stood at 126.2 (revised), and in the corresponding week of 1940, at 85.0. Rising again to 97 per cent of capacity, the steel ingot production series alone showed a gain. The automobile component was off fractionally when assemblies slid from 127,675 to 127,500. The heavy construction was down to 154.5 from 158.7. Lumber carloadings fell from 39,511 to 38,512.

FINISHED STEEL SHIPMENTS of the U. S. Steel Corp. in January, 9 per cent above December and 47 per cent higher than January, 1940, were 1,682,454 tons, all-time high for that month and within 1 per cent of the highest month on record, May, 1929, when 1,701,874 tons were shipped. Iron and steel exports in December, 735,178 tons (excluding scrap), were higher for the first month since August, 1940, being 3 per cent higher than November, and 87 per cent above December, 1939. The Iron Age scrap composite is 58c. lower at \$20.

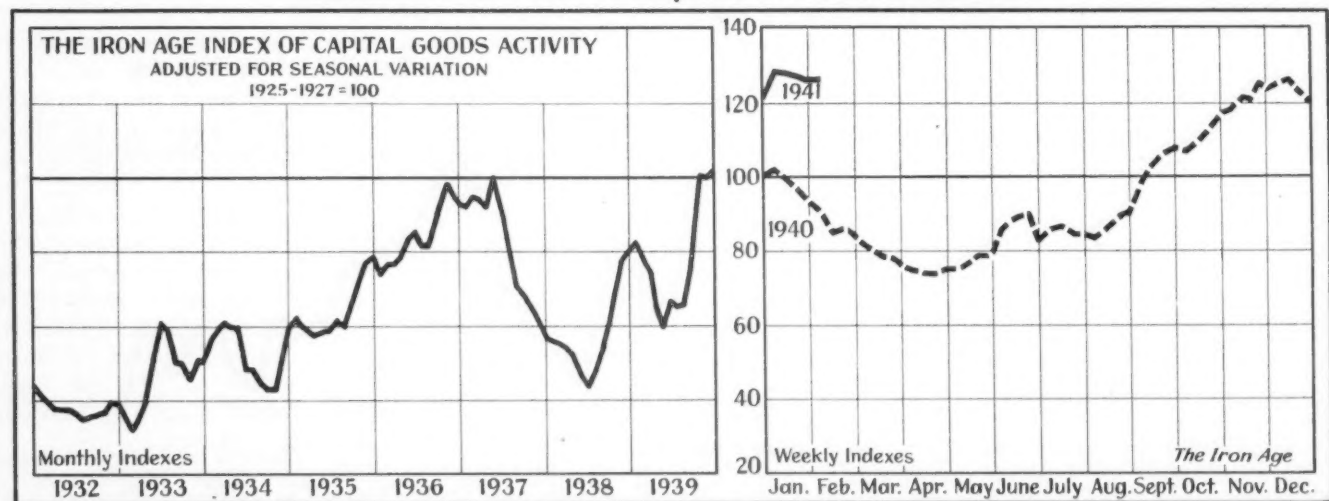
Strikes and Repairs Drop Steel Rate to 96%



District Ingot		Pitts-		Phila-	Cleve-		Wheel-		S. Ohio	West-		East-	Aggre-		
Production, Per	Cent of Capacity	burgh	Chicago	delphia	land	Buffalo	ing	Detroit	Southern	ern	St. Louis	ern	gate		
Current Week..	Previous Week..	98.0	95.5	91.0	98.0	89.0	104.5	85.0	100.0	94.0	109.0	102.5	105.5	108.0	96.0
		98.0	99.0	88.0*	98.0	88.0	104.5	85.0	96.0	94.0	109.0	102.5	105.5	108.0	97.0
* Revised.															

* Revised.

Declines In Four Components Lower Index

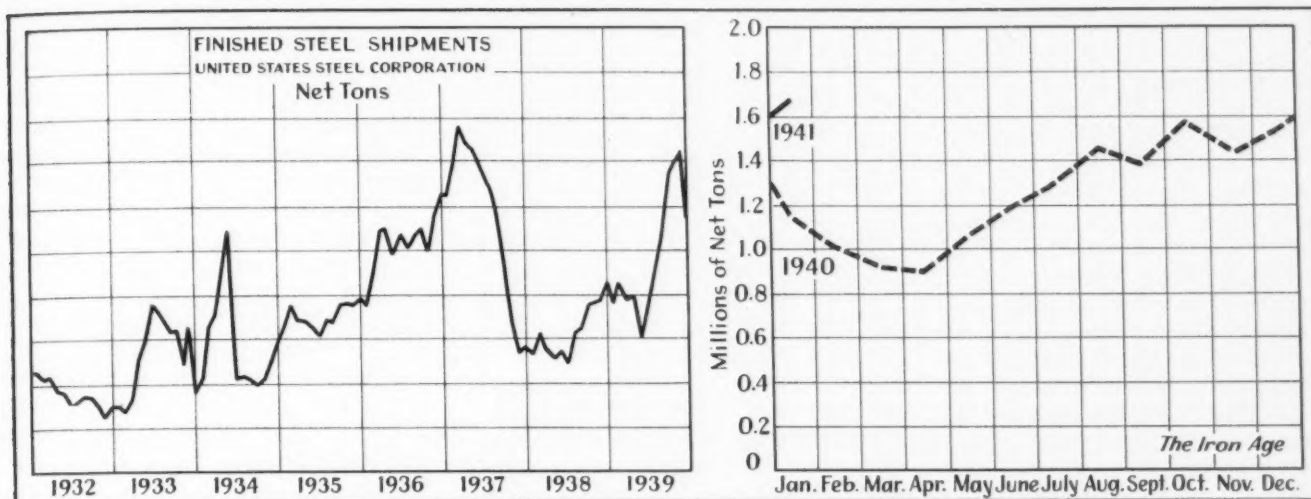


Component	Week Ended	Feb. 15	Feb. 8	Jan. 18	Feb. 17	Feb. 16
Steel ingot production ¹		130.1	129.9	135.3	91.0	117.4
Automobile production ²		134.7	135.3*	134.7	100.5	129.3
Construction contracts ³		154.5	159.2	157.7	78.6	132.9
Forest products carloadings ⁴		73.2	77.7	81.2	55.6	108.1
Pittsburgh output and shipments ⁵		127.7	129.2	130.2	99.2	117.2
COMBINED INDEX		124.0	125.7	127.8	85.0	121.0

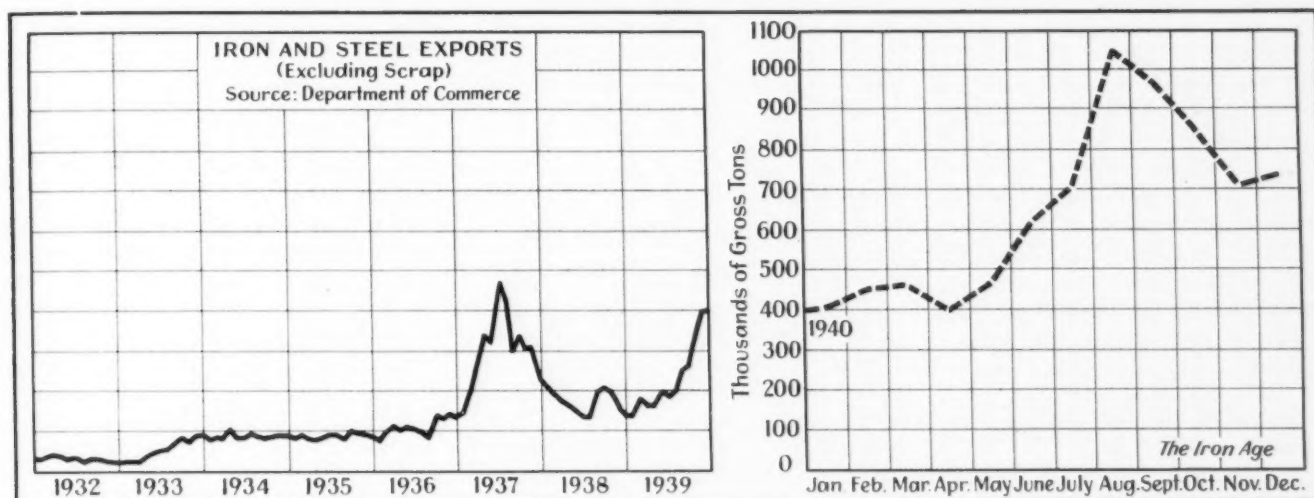
* Revised.

Sources: ¹ THE IRON AGE; ² Wards Automotive Reports; ³ Engineering News-Record; ⁴ Association of American Railroads; ⁵ University of Pittsburgh. Indexes of forest products carloadings and activity in Pittsburgh area reflect conditions as of week ended Feb. 8. Other indexes cover week of Feb. 15.

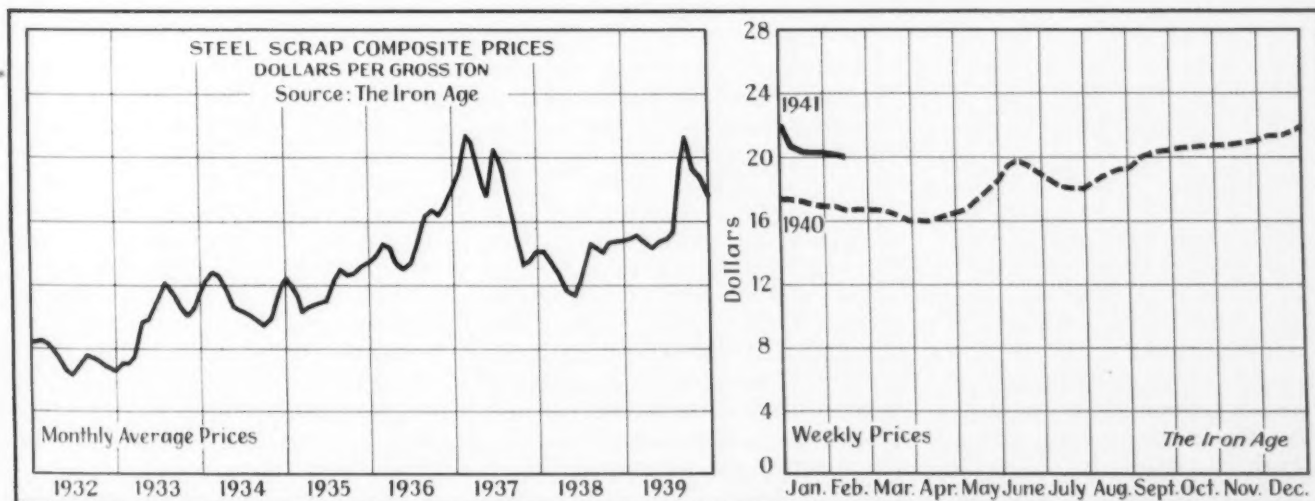
U. S. Steel January Shipments Highest In History



Downward Movement Of Steel Exports Halted



Rate Of Scrap Price Decline Slackens



Market News

...THE WEEK'S ACTIVITIES IN IRON AND STEEL

New Business

... Mills becoming more selective in taking orders

With less support from export demand than has been the case, PITTSBURGH reports total bookings last week to have been at a level somewhat above shipments and production. The volume of steel specifications so far this month at PITTSBURGH is running about 20 per cent ahead of a month ago. All orders are being scrutinized closely for evidence of attempts at overstocking, and complaints on inability to obtain enough supplies are being completely investigated. Steel makers insist that if they have proper cooperation from consumers, present facilities are ample to take care of actual requirements.

Although CLEVELAND and YOUNGTOWN steel sellers are becoming more selective week by week, new inquiries and specifications are undiminished in volume. Orders held by some divisions are as much as 500 per cent over the amount on the books one year ago.

Priorities are more noticeable at CLEVELAND and YOUNGSTOWN. All demands of the defense program are being met promptly, except where circumstances interfere, like labor disputes, which are beyond the control of producers.

Because all-time records were established in January by some CHICAGO producers, February new business is about on a par with that of the previous month. Sharp study of new orders is the rule at all mills as the industry there exercises extreme care to see that capacity is reserved for the most pressing needs. Practically all future orders are accepted with strings attached.

Structural steel is very active in that district directly owing to the defense program. Automotive buying is high and farm implement manufacturers who have been operating at very strong levels expect even greater activity.

February orders at BUFFALO are running an estimated 10 per cent ahead of the corresponding period last month at two of the district's three mills. Some business is being

turned down. The demand for special alloy and electric furnace steels continues unabated with promised deliveries as late as December in some instances.

Since the first of the year EASTERN PENNSYLVANIA producers have expected a breather in the heavy flow of incoming specifications, but to date they have looked in vain. Orders have continued in such a large volume that mills have been forced to refuse considerable business, offering to supply only those tonnages which would go into production within a reasonable interval after receipt.

Considerable industrial construction is projected for the Los Angeles area. Very little of it requires large structural steel tonnage but increased steel buying in connection with operations is presaged. New structural steel demand for military projects has slowed down.

Pig Iron

... Some selling for second quarter but most producers hold back

Tightness in supplies of pig iron is unrelieved. A good deal of trouble comes from the demands of consumers for special analyses, which under normal conditions they were able to get, but today in many instances they are forced to accept the analyses which the producers can furnish.

There has been some selling for second quarter, but in the main producers for the merchant market are refraining from such forward commitments. They have told their customers that they will take care of them to the best of their ability. However, some foundries are beginning to get nervous over the situation.

Republic Steel Corp. at Buffalo is experimenting with production of pig iron from an industrial residue called pyrites cinder now being shipped from Sulphide, Ont. The material, after being nodulized under intense heat in a kiln, is being used in place of ordinary iron ore in Republic's blast furnaces. The actual saving will be computed after a 30-day trial. The iron pyrites

are a natural yellow sulphide of iron from which sulphur dioxide has been extracted at the Nichols Chemical Co. plant near Ottawa. The supply is limited, but the experiment may mark a new trail in the use of low grade ores with iron content for manufacture of pig iron.

A cooperative working agreement, whereby the Republic plant at Buffalo will acquire part of the iron output from two blast furnaces at the Wickwire-Spencer plant was revealed this week. Republic is paying part of \$450,000 to repair the second blast at the Wickwire plant, idle since 1930. Both furnaces, however, will remain under Wickwire management.

At least one steel maker who was inquiring for basic iron in the PITTSBURGH district is understood to have obtained supplies within the past week. On the whole, the supply of pig iron there remains tight compared with aggregate demand.

At CHICAGO old customers are getting their iron requirements regularly, but new buyers do not fare so well. Special analyses are not welcomed. Some Northern producers are practically out of the market, while certain Southern interests are reported to be out until the third quarter.

The melt in the CINCINNATI area tends to expand with foundries running near to capacity. With the Hamilton Coke & Iron unit of the American Rolling Mill Co. still out of the market, shipment from stock has declined to about one-half of the January rate.

Two producers in EASTERN PENNSYLVANIA are now selling iron for second quarter delivery, and large tonnages have already been contracted for. First quarter iron is being allocated, with small tonnages available in most instances for consumers temporarily caught short.

NEW ENGLAND foundries are extremely busy and not a few of them are beginning to get a little worried about second quarter supplies. Most of the large foundries have enough iron to keep them going into the second quarter.

The Monterrey steel works of

Mexico has been attempting to buy 6000 to 10,000 tons of basic pig iron a month for the period that will be needed to rebuild its blast furnace.

At YOUNGSTOWN, Republic's No. 4 furnace, which is scheduled to be rebuilt soon but is being kept in production as long as possible, experienced a temporary suspension last Saturday due to a breakout of slag.

The Struthers furnace at Struthers, Ohio, which has been supplying merchant iron, has been blown out for relining and will be out of production four to six weeks. This will, of course, cause some additional tightness to merchant iron supplies in the VALLEY.

Steel Operations

... Rate drops to 96 per cent because of breakdowns and strikes

Breakdown of a blooming mill in the CHICAGO district, and work stoppages at YOUNGSTOWN and BUFFALO caused by labor have caused loss of steel production. The ingot rate was not seriously affected except at CHICAGO, where there has been a loss of three and a half points this week to 95½ per cent, but there has been interference with output of semi-finished and finished steel at the other two points.

Following the settlement of a strike at the Brier Hill plant of the Youngstown Sheet & Tube Co., ingot production in the VALLEY district has gained three points this week to 91 per cent from a revised rate of 88 per cent for last week. DETROIT operations have gained four points, and there has been a gain of one point at CLEVELAND.

Shipbuilding

... Federal gets contract for eight boats

Federal Shipbuilding & Dry Dock Co., Kearny, N. J., has been awarded a \$22,120,000 contract by the Maritime Commission for the construction of eight C-2 type, steam-propelled cargo ships. The company had bid \$2,765,000 each on an adjusted price basis. Estimated steel requirements are 28,800 tons.

Isthmian Steamship Co., subsidiary of United States Steel Corp., has entered into a contract with the United States Maritime Com-

mission for the purchase, under the construction differential subsidy provisions of the Merchant Marine Act of 1936, of eight C-3 type steam driven turbine cargo vessels. The construction cost of the vessels will approximate \$2,800,000 each. The vessels are scheduled for delivery during the first six months of 1942. Four of the ships are now being fabricated in the yards of the Seattle-Tacoma Shipbuilding Corp., Seattle, Wash., and four in the yards of the Western Pipe & Steel Co., San Francisco.

Railroad Buying

... Orders placed for 2400 freight cars

Twenty-four hundred freight cars were ordered in the past week, some 8700 tons of rails and a few locomotives.

Subject to court approval, the New York, New Haven & Hartford has placed a tentative order for 1000 box cars with Pressed Steel Car Co. and five electric freight locomotives with Westinghouse Electric & Mfg. Co.

The Grand Trunk Western has distributed 600 cars as follows: 100 flat cars to Greenville Steel Car Co., 200 gondolas to Magor Car Corp., and 300 box cars to Pressed Steel Car Co.

Chicago, Milwaukee, St. Paul & Pacific will build in own shops 500 box, 25 caboose and six well flat cars.

McKeesport Connecting has ordered 100 70-ton low side gondola cars from the American Car & Foundry Co.

Utah Copper Co. bought 75 ore cars from the Pressed Steel Car Co.

The United States Army and Navy have ordered 53 box cars from the Greenville Steel Car Co.

The St. Louis Refrigerator Car Co. has placed an order for 35 light weight refrigerator cars with own shops.

Bessemer & Lake Erie is purchasing five 90-ton hopper cars from the Pullman-Standard Car Mfg. Co.

Gulf, Mobile & Ohio and Bangor & Aroostook bought a total of 8733 tons of rails.

There are a number of inquiries

and court authorizations. Among them, the Rock Island Lines were authorized to purchase equipment for \$7,800,000. This will include improvements in roadway and structures, 10 diesel switching locomotives and improvements and modernization in existing equipment. This is in addition to large orders for rails and material recently placed.

Wabash has been authorized to provide 150 automobile freight cars, 50 gondolas and 15 cabooses. Grand Trunk Western is inquiring for 25 4-8-4 type locomotives, and the Minnesota Transfer Railway for three diesel-electric switchers, while the Great Northern will rebuild eight locomotives at Hill-yard, Wash. The National Tube Co. is inquiring for 44 to 100 70-ton gondolas.

While there has been some rumbling concerning the production and shipment of rails to various roads, steel makers have the situation fairly well in hand. The Chesapeake & Ohio has awarded 45 all-steel cars, for delivery next summer, as follows: to Ralston Steel Car Co., Columbus, 25 flat cars; to Greenville Steel Car Co., Greenville, Pa., 20 flat and well cars, four of them being 61 ft. 4 in. long and of the 125-ton type.

Semi-Finished Steel

... Mills cooperating to relieve tight supply situation

Total demand for semi-finished steel items continues to outrun the ability of producers to supply requirements. It is pointed out, however, that some of the current demands springs from anxiety concerning future deliveries. Although the supply situation, especially with regards to billets and sheet bars, remains tight, some tension has been relieved by cooperation among steel makers. As pointed out here some time ago, various steel companies have made arrangements whereby each help to supply temporary deficiencies. The tendency in this direction has been greatly enlarged and some small plants are now in the process of furnishing billets and slabs for processing at units of some of the larger steel companies. These arrangements have been worked out at considerable cost and time to all parties involved but are good examples of the general attempt to straighten out temporary shortages.

Merchant Bars

... Orders still heavier than shipments, deliveries lengthen

Although down slightly from a week ago, bar sales at PITTSBURGH still aggregate a greater tonnage than current shipments. Demand is extremely miscellaneous with the motor car industry amply represented.

At CLEVELAND and YOUNGSTOWN, where July production schedules are being made up for some mills, a few recent inquiries have shown an astonishing gain over normal requirements of the individual users. All inquiries are subject to strict scrutiny. Sales at CLEVELAND up to Feb. 15 were approximately 35 per cent larger than in the corresponding part of January. Despite the fact bar mills have been shattering production records since Jan. 1, orders are still heavier than shipments.

CHICAGO mills see no slackening in bar business, orders flowing in from the broadest assortment of interests. Farm implement manufacturers, forgers, cold finishers and shell makers are taking steady allotments. Deliveries range from eight to 42 weeks, certain alloy varieties getting the longest promises.

Sheets and Strip

... Automotive demand ranks first in flat rolled steel

Automotive demand is first, household appliances rate second, and a wide diversity of miscellaneous business ranks third on sheet order books in the PITTSBURGH district. Consumers are still placing orders on books for delivery at some future date, hence the bulk of current buying obviously represents forward purchases. In cases where consumers insist that they receive a tonnage in excess of what steel makers believe to be their requirements, a complete investigation is being made. Application of "pressure" by large consumers is not being allowed to cut down the chances of small users obtaining their relative share of current production.

At CLEVELAND sellers of flat rolled products report specifications to be undiminished from the high volume of other recent weekly periods. Large orders for pressed steel household equipment for na-

tional defense housing have provided a market feature in the VALLEYS district. Bathtubs, sink and base cabinets, broom closets, and other household items are desired in large quantities. Residential boilers are also in heavy demand. Makers of steel shelving and kindred equipment hold large order backlogs.

Leading CHICAGO steel makers are closely watching sheet orders with demand at very high levels and backlogs growing larger. Some producers are turning down orders more frequently. Narrow strip is now promised in four to five months, wide strip getting a slightly better delivery. Enameling iron and cold rolled are promised in September by one mill. Hot rolled items are little better.

With the leading SOUTHERN OHIO mill out of the market for a short period last week, sheet bookings by that interest were not as great as in the previous period. This, however, was a technicality, since orders flowed in as soon as the temporary embargo was lifted. Some business for the third quarter is reported, but the bulk is still for second.

Reinforcing Steel

... Awards only 6050 tons but inquiries top 20,000 tons

Reinforcing steel awards dropped to 6050 tons from 13,570 tons a week ago. The only sizable letting is 1800 tons for Navy aviation storage buildings at Oakland, Cal.

New reinforcing steel projects of 20,240 tons include 5200 tons for igloos at the Army Ordnance Depot, Hermiston, Ont.; 5000 tons for igloos at the Army Ordnance Depot, Fort Wingate, N. M., and 3300 tons for a bagging plant for the Hercules Powder Co., Radford, Va.

Sales at CLEVELAND and YOUNGSTOWN up to Feb. 15 showed a very sharp gain over the corresponding part of January.

The revision in quantity extras for concrete bars mentioned here recently has now become more or less general. The 10c. a 100 lb. trucking charge established several months ago for major basing points, New England and New York areas, is now being applied at all points.

Tubular Goods

... Recent improvement in orders is sustained

Retaining the pace set more than a week ago, tubular sales at PITTSBURGH reflects a stronger oil country goods demand, increased small and miscellaneous line pipe requirements, and a heavy flow of merchant pipe to jobbers. In some instances, standard pipe is moving out of stocks faster than it is being replenished.

Later reports on the contemplated gas line to run from Texas to Chicago and to be built by Natural Gas Co. of America indicate a steel tonnage required of 150,000 tons instead of 100,000 tons as reported last week. The pipe, 26 in. diameter, is to be furnished by a Midwestern pipe fabricator.

CHICAGO producers report ability to deliver the average jobbers' car within one week to 10 days.

Plates

... Congestion of orders forces mills to curb buying

Plate tonnage flowing to PITTSBURGH is still in excess of current production. Plate output is being stepped up substantially though by high speed mills. One mill in the PITTSBURGH district, which is producing both plates and sheets, rolled approximately 93,000 tons of flat rolled material last month. This output is substantially above the so-called theoretical capacity of the mill. Deliveries are four to five months, in some cases longer.

CLEVELAND reports that sales are showing a large gain this month, reflecting heavy tonnages from Pacific Coast shipyards. Additional shipbuilding allocations are likely to increase the gains if they materialize before the end of the month.

Delivery extensions in sheared and universal plates were again announced by a leading CHICAGO mill. A sales office there is not seeking plate business in that district since demand is so great in the area served by the producing mill. Railroad car builders have slackened steel purchases, but railroads themselves have stepped up demands so car steel remains at a strong level.

Plates are the scarcest items on mill lists in EASTERN PENNSYLVANIA. One producer is out of the

market and another large mill is out except to customers who have already made their advance needs known. All sellers are extremely hesitant to accept orders involving sizable tonnage and, in an attempt to maintain some semblance of flexibility in schedules in the last half of the year, heavy tonnages have been refused. In the past week deliveries have been further extended. The largest consumers in the district are shipbuilders, who specify regularly and in heavy volume. Another yard, beginning operation soon, will add to this demand.

Tin Plate

... Sales increasing ... cold reduced production 92%

Paced by a strong demand from miscellaneous sources, the volume of tin plate sales was increased somewhat in the past week. A definite improvement was noted in export buying which has been expanding for the past three weeks. In some instances eight weeks are being promised on tin plate shipments. There is no doubt that much of the miscellaneous buying is stemming from general line can makers and involves to some extent material which would fall in the non-defense category. Cold reduction tin plate mills are estimated to be operating this week at 92 per cent of capacity, up seven points from a week ago.

Structural Steel

... Awards 23,850 tons and inquiries are 29,850 tons

Fabricated structural steel awards are slightly lower at 23,850 tons. The largest lettings are 8700 tons at Melrose Park, Ill., for an aircraft engine plant for the Buick Motor Co.; 3500 tons at Quincy, Mass., for the Fore River Shipbuilding plant of the Bethlehem Steel Co.; 2700 tons at Flint, Mich., for a car storage and driveway building for the Buick Motor Co., and 1000 tons for hangars for the Glenn L. Martin Co. at Middle River, Md.

Structural steel projects declined to 29,850 tons from 33,650 tons last week. Sizable new inquiries include 7000 tons for a bridge across the Mississippi River at Dubuque, Iowa; 6000 tons for curbing in New York and Brooklyn; 3500 tons

at Euclid, Ohio, for the Defense Plant Corp.; 3000 tons for an ordnance plant at Milan, Tenn., on which bids were taken Feb. 19; 3000 tons for a trestle at Norfolk, Ark., for the Norfolk Dam, and 2000 tons for a quay wall and pier at the Mare Island Navy Yard, Cal.

Bolts, Nuts and Rivets

... Raw material shortages are being felt

Temporary shortages of certain sizes and analyses of raw material, particularly alloy grades, are being felt occasionally in the bolt and nut industry. The problem is intensified by last-minute orders from users who have been accustomed to being served quickly.

Rivet makers at CLEVELAND report order backlogs have risen as shipbuilding and other defense projects gain momentum. Large government awards have been received recently at CLEVELAND. The Upson bolt works of Republic at CLEVELAND is being enlarged, and certain operations will be housed in the new quarters.

Wire Products

... Orders heavy but situation is less tense than in other products

Incoming business at PITTSBURGH still exceeds production and shipments. Conditions in the wire market, however, have not reached the tense stage apparent in other items. Manufacturers' wire demand is strong and rod capacity is being taxed to the utmost.

Aggregate bookings were high again last week at CLEVELAND. Manufacturers' items are the subject of heavy inquiry, and merchant products are more active than usual at this season. Demand for welding wire is particularly heavy in the CLEVELAND area.

Coke

... Additional beehive ovens are being brought in

Additional beehive coke ovens in western Pennsylvania are being brought in rapidly. Available ovens last week numbered approximately 9000 with close to 8000 producing coke. An additional 400, which are now being repaired, will be in operation soon. About eight months

ago there were only 6600 available with about 5500 operating.

Iron Ore

... Consumption in January at all-time record

Consumption of Lake Superior iron ore in January totaled 6,331,018 gross tons, a new all-time record, according to the Lake Superior Iron Ore Association, Cleveland. The figure compares with 6,173,038 gross tons used in December, and 5,289,308 tons consumed in January, 1940.

Ore on hand at furnaces and Lake Erie docks Feb. 1 totaled 29,794,047 gross tons, compared with 36,072,833 tons on Jan. 1 and 30,189,247 tons on Feb. 1, 1940.

The association reports 167 furnaces using Lake ore in blast Jan. 31 and 19 idle out of a total of 186. This compares with 166 active Dec. 31 and 23 idle at that time. On Jan. 31, 1940, only 142 stacks were producing from Lake Superior ore.

Sheet and Tubes' Brier Hill Strike Is Ended

... A walkout at the Brier Hill plant of Youngstown Sheet & Tube Co. interfered with steel production late last week. The strike ended Saturday, Feb. 15, when SWOC members accepted company proposals, but open hearths lost additional time because of the necessity for heating up.

Harriman Will Expedite Material Flow to Britain

... W. Averil Harriman, board chairman of the Union Pacific Railroad and chief of the OPM's materials branch, on Tuesday was appointed by the President to expedite the flow of war materials to Great Britain after passage of the Lend-Lease Bill. Mr. Harriman, who will go to London in about two weeks, has been given the title of "defense expeditor."

Steel Institute's General Meeting to Be Held May 22

... The 50th general meeting of the American Iron and Steel Institute will be held at the Waldorf-Astoria, New York, on Thursday, May 22, 1941.

Machine Tools

... SALES, INQUIRIES AND MARKET NEWS

Used Machinery Prices Liberal

New York

••• The attitude among used machinery dealers here is that the schedule on second-hand and rebuilt machine tool prices, issued by the Price Stabilization Division of the National Defense Advisory Commission on Monday, is liberal in that the schedule fixes prices in percentage of current list prices of equivalent new machine tools. For rebuilt and guaranteed machines, these percentages range from 95 per cent for machines less than five years old down to 70 per cent for machines built before 1920. Machines in the "as is" condition are given a 20 per cent lower ceiling price, which is considered by some as too wide a margin for machines of recent vintage, many of which will require no reconditioning to be as serviceable as new. The liberal feature of this "Price Schedule No. 1" (details printed elsewhere) lies in the fact that present day new equipment has such superior construction, easier handling features and much wider speed ranges, as hardly to be comparable with the "equivalent" machine tool made 15 to 20 years ago.

The pace of new machine tool sales is not quite as hectic as it has been, but is still well above normal. No appreciable slackening is expected this year. Dealers have advised all their customers that they must obtain a priority rating from the Office for Production Management if they are to receive consideration on delivery after Feb. 28. Some orders have been received, however, from plants which admit their inability to get a rating and seem willing to wait out the emergency. One large aircraft manufacturer, accustomed to getting preference treatment without formal ratings, has suddenly found it necessary to apply for ratings on large blocks of machine tools ordered last summer. All machinery bought recently on behalf of the Defense Plant Corp. has had preference ratings assigned.

Used Machines for Schools

Washington

••• The Priorities Division of the Office of Production Management has sent out word that it cannot grant applications for priority certificates on machine tools ordered by schools and other educational institutions engaged in training workers, and has recommended that so far as possible second-hand tools be used.

In a letter addressed to school representatives, the Priorities Division stated that while there is full realization of the fact that trained men are just as necessary as machine tools for the defense effort, for the present at least, the needs of educational institutions for machine tools must be met as far as they can be by finding second-hand or presently unused tools. The work of rebuilding or repairing second-hand tools is suggested as an effective step in training youth.

Production on the Increase

Cleveland

••• Judging from conditions here, a fair cross-section of the industry, the production rate this month is running ahead of January and will continue to rise during March. Buying continues to be brisk.

Eaton Mfg. Co. here plans to put into operation in May around \$1,000,000 worth of equipment to make propeller shafts for the Wright aircraft engines. It is reported the government is furnishing funds for the purchases.

Thompson Products, Inc., another aircraft parts maker, has rented extra space where it will set up machinery for its new \$15,000,000 plant as quickly as it is delivered. Thus it will be possible to get the equipment into production sooner and at the same time to train the necessary personnel. Procedure somewhat along the same line has been adopted by other companies in Ohio during recent months.

Extend Engineering Service

Cincinnati

While sales efforts at the present time are not urgently necessary because of the tremendous volume of machine tool orders that continue to pour into the market, small evidences that machine tool executives are looking beyond the present boom crept into the market the past week. One or two companies have extended sales and customer service forces in certain fields to assist in any manner desired by tool users to establish and continue to cultivate that good will which will stand the company in good stead when there is no longer a defense effort.

Plant expansions under way are being pressed with utmost urgency and Saturday working forces have been extended further into the overtime periods. Except for a few departments in one or two plants, however, the seven day week has not yet materialized.

Priorities are being exerted closely and no tools, except for the defense work, are receiving attention. This source, however, continues to swell the already bulging order books.

New Type of Metal Container Developed

Washington

••• The Quartermaster Corps, War Department, has announced that it has developed a new type of metal container which will greatly improve facilities for handling small quantities of water, oil and gasoline, and is developing it further as an insulated food and drink unit. Made of steel and galvanized, the container has a 5 gal. capacity, weighs 40 lb., is rectangular to facilitate storage, about 6 in. thick, 13 in. wide and 18 in. high, and has three handles to aid in carrying it. It can be easily opened by hand but will not open itself. A vent pipe attached inside the spout provides an even flow of liquid. Orders have been placed for nearly 700,000 containers.

Non-Ferrous Metals

... MARKET ACTIVITIES AND PRICE TRENDS

New York, Feb. 18—A different aspect was apparent in three of the major non-ferrous markets in the past week. As what appeared to be a crisis in the Far East developed, domestic tin demand suddenly strengthened, while prices jumped 1½c. Lead buyers showed less inclination to stock metal and demand in that market eased off considerably. Consumers of copper exerted less pressure for materials following the completion of plans to allocate the government's supply of copper.

Domestic copper deliveries in January rose to a new all-time high, statistics released in the past week show. January shipments, 119,736 tons, were 6 per cent above December deliveries of 112,671 tons. Refined stocks showed a heavy drop of 19 per cent, being 116,341 tons, as compared with 142,772 tons at the end of December. Production also fell to 93,327 tons, from 97,035 tons. In the regular market during the past week mine producers allocated metal at 12c., delivered Valley, while demand from custom smelter slackened at the unchanged price of 12.50 for March delivery. Export interest was quiet at 10.50, f.a.s.

Lead

Some time intervened after last week's price advance before demand showed any signs of falling off. Since sales, however, for the previous couple of weeks had been considerably in excess of consumption it was only natural that consumers should temporarily become satisfied and exert less pressure for material. At the end of the week and the beginning of this week sellers reported that the market was noticeably easier and that sales, in some cases less than quotas, had fallen off mainly to carload lots for prompt shipment. February requirements are theoretically taken care of, although limited quantities always are available for prompt delivery. March needs are between 60 and 65 per cent filled. The market remains firm at 5.65c. a lb., delivered New York.

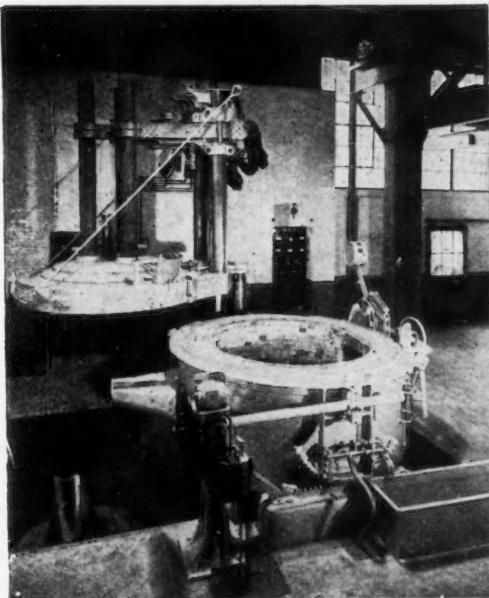
Tin

Increased tension in the Far East in the past week resulted in an immediate strengthening of interest in the domestic market. Uneasy buyers, heretofore understood to be well covered for first quarter needs, came into the market in large numbers seeking tin for prompt delivery in an effort to supplement stockpiles against eventualities. There was very heavy buying of anything afloat, while unshipped tin attracted no interest. Prompt Straits metal rose to 51.75c. a lb., delivered New York, while March and April delivery were offered for 51.50c. The Metals Reserve Co.'s purchases of tin now total 55,000 tons, it was revealed during the week.

Zinc

Greatest attention in the past week was given to facilitating an adequate flow of zinc to those consumers working directly on defense work, most important of which are shell and cartridge case makers. It was suggested to other consumers, particularly those having little to do with the defense program, that plastics be used wherever possible to conserve zinc for more critical uses. Meanwhile in the regular market producers made and immediately shipped every possible pound. Sales were off considerably in the week to 1188 tons from 3682 tons in the preceding period. Shipments were also down to 4728 tons, while backlogs fell to 112,660 tons.

(Non-ferrous prices on page 115.)



**USE
MOORE RAPID
LECTROMELT
FURNACES
for
MELTING
REFINING
SMELTING**

Illustration shows top charge type LECTROMELT furnace with roof raised and rotated to one side to permit quick charging with drop bottom bucket.

LECTROMELT furnaces offer the rapid and economic means for the production of plain carbon and alloy steel ingots and castings as well as gray and malleable irons. Top charge and door charge types are both available. LECTROMELT furnaces are built in standard capacities from 25 pounds to 100 tons. Write for details.

PITTSBURGH LECTROMELT FURNACE CORP.
Foot 32nd St. Pittsburgh, Pa.

Scrap

...MARKET ACTIVITIES AND QUOTATION TRENDS

The imperative need for fixing differentials on scrap as between districts and grades, which was pointed out by THE IRON AGE at the inception of the government program for price stabilization, has not yet resulted in any action, although a meeting was held last Saturday in Pittsburgh by prominent members of the Institute of Scrap Iron and Steel to discuss the situation. The Price Stabilization Division of the National Defense Commission apparently did not want to undertake the task because it might savor of a greater degree of price control than the circumstances seemed to warrant, while on the other hand the scrap organization did not want to take any step which would savor of price conspiracy.

Now, however, Assistant Attorney General Thurman Arnold has ruled that there is no conspiracy under the anti-trust laws where business men have been directed by a government agency to take certain action with respect to prices, but he pointed out that the government bureaus must take the responsibility by giving the necessary directions publicly.

It may be inferred from this ruling that the Price Stabilization Division may work out differentials based on past normal trends in the industry.

Scrap is slow in coming out all over the country and a particular shortage in cast grades has resulted in an upward movement of prices in some markets. Steel scrap, on the other hand, is generally unchanged from last week. Pittsburgh has moved the average price for No. 1 by quoting a flat \$21 a ton, which puts THE IRON AGE composite price for scrap to \$20.08. At Youngstown and Cleveland the spread for heavy melting steel quotations has been widened, thus increasing the average by 25c. to \$21 and \$20.50 respectively.

St. Louis

This market is unchanged. A Kansas City mill bought a round tonnage of No. 2 heavy melting steel at prevailing quotations. No purchases were made by district mills, and no deals are pending. Shipments from the country continue heavy.

Cincinnati

The scrap market has a steadier tone as the trade becomes more accustomed to the arbitrary price situation. Supply of scrap is still not plentiful. Contract movement is steady and quotations are unchanged.

Detroit

Automotive lists closing at mid-month resulted in the sale of unusually large tonnages for this period of the year since automobile production itself shows no signs of tapering and scrap output is staying at a high level. However, other sources of scrap are not nearly so fluid as they were a few weeks ago. Prices are steady amid considerable uncertainty. The principal consumer indicates the belief that prices will continue on a downward curve but, so far as can be learned, there has been no reduction in brokers' buying prices in the last week. The trade is expressing considerable interest in prospects of lower prices on March railroad lists.

New York

A scrap sale early this week by the Interborough Rapid Transit Co. brought prices for some items above the general market level and a wide spread in bids. A lot of 1200 tons of rails went to Harry Harris & Co. for \$22.40 a ton, the next bidder being Luria Steel & Trading Corp., which offered \$19.05. Another item of 400 tons of miscellaneous car scrap was sold at \$16.16. It appears, however, that—apart from rails—the material was bought for export, since quoted domestic prices are unchanged from last week. Demand is strong, but brokers report difficulty in filling orders.

Boston

Generally, prices have changed little. Those for blast furnace material are an exception and take a wide range, for eastern Pennsylvania being as low as \$8.65 a ton, f.o.b. and for Pittsburgh district as high as \$9.75 a ton, f.o.b. Those for textile and machinery cast show more underlying strength than those for other materials. Yards report a shortage of the last two named materials. While all varieties of scrap are moving, there is no real life to the market. Boston Navy Yard has sold several hundred tons of steel scrap to an exporter at better than \$16 a ton.

Pittsburgh

Until such time as the market is more clarified than at present, various quotations on major scrap grades will be nominal to some extent. Some brokers who took orders a week ago at \$21 are paying this price to cover. Other brokers and dealers who have offered \$20.50 for No. 1 steel, but who have been unable to obtain any supplies, are stymied for the time being.

The opinion here is that as long as no differentials between districts are established, there is no chance of outside material flowing into this area. Some brokers and scrap buyers consider the situation to be approaching a crisis. Action from Washington on the question of differentials is looked for soon.

Chicago

Supply of scrap gets tighter here as brokers experience greater difficulty in covering on contracts. Most brokers have sought trading positions to cut down inventories as much as possible. Mills are reported to be using up their stocks, one at an approximate rate of 5000 tons a week. Only one mill is known to have increased its stock on hand. Dealers are inclined to hold tight and the industry is giving considerable thought to the question of scrap supplies at distant points. This material, of course, cannot be moved profitably at present freight rates.

Philadelphia

Consumption buying was lacking again in the past week and all prices are unchanged. What scrap is coming out is being shipped immediately against old orders, but the flow is not abundant and most mills are probably consuming scrap right now faster than the rate at which they are able to replenish stockpiles.

Youngstown

This week a range of \$1 a ton on No. 1 heavy melting steel and allied grades appears more representative of market conditions than the customary 50c. spread. No. 1 is quoted at \$20.50 to \$21.50.

Cleveland

Instead of a range of 50c. on No. 1, No. 2 and compressed sheets, it has been widened to \$1 this week. Attracted by lower prices, more buyers are in the market. The push on cast iron grades continues to be strong.

Buffalo

No. 1 heavy melting steel still is holding on to a \$20.50 to \$21 quotation but dealers now predict a drop to a flat \$20 a ton likely in the next week or two. A definite slackening has been noted in the flow of scrap to market; this is attributed partly to bad weather conditions and partly to the fact small collectors of scrap here have abandoned that business for more lucrative activities. Cast scrap is very strong and cast iron carwheels are up \$1 this week. Dealers here appear to be reluctant to adopt price lists representing specific differentials over Pittsburgh prices as suggested there last week-end, fearing such action would be a violation of anti-trust laws against price fixing.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	21.00
Railroad heavy mltng.	20.00
No. 2 heavy melting	19.50 to 20.00
Railroad scrap rails	24.00 to 24.50
Comp. sheet steel	21.00
Hand bundled sheets	19.50 to 20.00
Heavy steel axle turn.	19.50 to 20.00
Heavy steel forge turn.	18.50 to 19.00
Machine shop turnings	15.50 to 16.00
Short shov. turn. alloy	
free	16.50 to 17.00
Mixed bor. & turn.	17.00 to 17.50
Cast iron borings	17.00 to 17.50
Cast iron carwheels	22.50 to 23.00
Heavy breakable cast.	18.00 to 18.50
No. 1 cupola cast.	22.00 to 22.50
RR. knuckles & coup.	26.00 to 26.50
Rail coil springs	27.00 to 27.50
Rail leaf springs	27.00 to 27.50
Rolled steel wheels	27.00 to 27.50
Low phos. billet crops	26.50 to 27.00
Low phos. punchings	26.50 to 27.00
Low phos. heavy plate	25.50 to 26.00
Railroad malleable	26.00 to 26.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	20.00
No. 2 hvy. mltng. steel	18.50
Hydraulic bund., new	20.00
Hydraulic bund., old	17.00
Steel rails for rolling	25.00 to 26.00
Cast iron carwheels	23.00
Hvy. breakable cast.	22.00 to 22.50
No. 1 cupola cast	23.50 to 24.00
Mixed yard (f'd'y) cast	20.50
Stove plate (steel wks.)	19.00 to 19.50
Railroad malleable	23.50 to 24.00
Machine shop turn.	14.50
No. 1 blast furnace	14.00
Cast borings	16.00
Heavy axle turnings	19.50
No. 1 low phos. hvy.	26.00 to 26.50
Couplers & knuckles	26.00 to 26.50
Rolled steel wheels	26.00 to 26.50
Steel axles	25.00 to 25.50
Shafting	25.00 to 25.50
Spec. iron & steel pipe	18.00 to 18.50
Cast borings (chem.)	16.00

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel	19.00 to 19.50
Auto. hvy. mltng. steel	
alloy free	18.00 to 18.50
No. 2 auto. steel	16.00 to 16.50
Shoveling steel	19.00 to 19.50
Factory bundles	18.50 to 19.00
Dealers' bundles	17.00 to 17.50
No. 1 busheling	18.00 to 18.50
No. 2 busheling, old	10.50 to 11.00
Rolled carwheels	22.50 to 23.00
Railroad tires, cut	23.00 to 23.50
Railroad leaf springs	22.50 to 23.00
Steel coup. & knuckles	22.50 to 23.00
Axle turnings	18.25 to 18.75
Coil springs	24.00 to 24.50
Axle turn. (elec.)	19.75 to 20.00
Low phos. punchings	23.00 to 23.50
Low phos. plates 12 in.	
and under	22.75 to 23.25
Cast iron borings	13.75 to 14.25
Short shov. turn.	14.00 to 14.50
Machine shop turn.	13.50 to 14.00
Rerolling rails	23.50 to 24.00
Steel rails under 3 ft.	23.00 to 23.50
Steel rails under 2 ft.	23.75 to 24.25
Angle bars steel	22.75 to 23.25
Cast iron carwheels	20.00 to 20.50
Railroad malleable	23.50 to 24.00
Agric. malleable	17.50 to 18.00
Per Net Ton	
Iron car axles	23.50 to 24.00
Steel car axles	24.00 to 24.50
Locomotive tires	18.00 to 18.50
Pipes and flues	14.00 to 14.50
No. 1 machinery cast.	19.00 to 19.50
Clean auto. blocks	18.50 to 19.00
No. 1 railroad cast.	17.50 to 18.00
No. 1 agric. cast.	16.50 to 17.00
Stove plate	13.75 to 14.25
Grate bars	14.00 to 14.50
Brake shoes	14.25 to 14.75

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	20.50 to 21.50
No. 2 hvy. mltng. steel	19.25 to 20.25
Low phos. plate	24.00 to 24.50
No. 1 busheling	20.00 to 20.50
Hydraulic bundles	20.25 to 21.25
Machine shop turn.	14.00 to 14.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	20.00 to 21.00
No. 2 hvy. mltng. steel	19.00 to 20.00

Comp. sheet steel	19.50 to 20.50
Light bund. stampings	15.00 to 15.50
Drop forge flashings	18.00 to 18.50
Machine shop turn.	12.50 to 13.00
Short shov. turn.	14.50 to 15.00
No. 1 busheling	19.25 to 19.75
Steel axle turnings	19.50 to 20.00
Low phos. billet and bloom crops	24.50 to 25.00
Cast iron borings	14.50 to 15.00
Mixed bor. & turn.	14.50 to 15.00
No. 2 busheling	14.50 to 15.00
No. 1 machinery cast.	23.00 to 23.50
Railroad cast	22.00 to 22.50
Railroad grate bars	15.00 to 15.50
Stove plate	15.00 to 15.50
Rails under 3 ft.	25.50 to 26.00
Rails for rolling	26.00 to 26.50
Railroad malleable	24.50 to 25.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	20.50 to 21.00
No. 2 hvy. mltng. steel	18.50 to 19.00
Scrap rails	22.00 to 22.50
New hvy. b'ndled sheets	18.00 to 18.50
Old hydraulic bundles	17.00 to 17.50
Drop forge flashings	18.00 to 18.50
No. 1 busheling	18.00 to 18.50
Machine shop turn.	13.50 to 14.00
Shov. turnings	15.00 to 15.50
Mixed bor. & turn.	14.00 to 14.50
Cast iron borings	14.00 to 14.50
Knuckles & couplers	25.00 to 25.50
Coil & leaf springs	25.00 to 25.50
Rolled steel wheels	25.00 to 25.50
No. 1 machinery cast.	21.50 to 22.00
No. 1 cupola cast.	20.00 to 20.50
Stove plate	17.50 to 18.00
Steel rails under 3 ft.	27.00 to 27.50
Cast iron carwheels	20.50 to 21.50
Railroad malleable	24.00 to 24.50
Low phos. plate	26.00 to 26.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	18.00 to 18.50
No. 1 hvy. melting	17.50 to 18.00
No. 2 hvy. melting	16.50 to 17.00
No. 1 locomotive tires	19.50 to 20.00
Misc. stand. sec. rails	19.50 to 20.00
Railroad springs	21.50 to 22.00
Bundled sheets	12.50 to 13.00
Cast bor. & turn.	11.00 to 11.50
Machine shop turn.	10.75 to 11.25
Heavy turnings	13.50 to 14.00
Rails for rerolling	22.00 to 22.50
Steel car axles	25.00 to 25.50
No. 1 RR wrought	14.00 to 14.50
No. 2 RR wrought	16.00 to 16.50
Steel rails under 3 ft.	23.50 to 24.00
Steel angle bars	21.25 to 21.75
Cast iron carwheels	21.00 to 21.50
No. 1 machinery cast.	19.50 to 20.00
Railroad malleable	20.00 to 21.00
Breakable cast	17.50 to 18.00
Stove plate	15.00 to 15.50
Grate bars	14.00 to 14.50
Brake shoes	13.50 to 14.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel	18.25 to 18.75
No. 2 hvy. mltng. steel	16.25 to 16.75
Scrap rails for mltng.	23.25 to 23.75
Loose sheet clippings	12.75 to 13.25
Hyd'lic bundled sheets	17.00 to 17.50
Cast iron borings	9.25 to 9.75
Machine shop turn.	10.00 to 10.50
No. 1 busheling	14.25 to 14.75
No. 2 busheling	7.75 to 8.25
Rails for rolling	24.50 to 25.00
No. 1 locomotive tires	20.25 to 20.75
Short rails	26.25 to 26.75
Cast iron carwheels	18.75 to 19.25
No. 1 machinery cast.	22.25 to 22.75
No. 1 railroad cast.	20.50 to 21.00
Burnt cast	12.75 to 13.25
Stove plate	12.75 to 13.25
Agricul. malleable	18.00 to 18.50
Railroad malleable	21.00 to 21.50
Mixed hvy. cast.	19.25 to 19.75

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting steel	18.00
No. 2 hvy. melting steel	17.00
No. 1 busheling	16.00
Scrap steel rails	18.00
Steel rails under 3 ft.	20.00
Rails for rolling	19.00
Long turnings	9.50
Cast iron borings	8.50
Stove plate	13.50
Steel axles	18.00
No. 1 RR wrought	16.00
No. 1 cast	18.50
No. 2 cast	13.50
Cast iron carwheels	19.00
Steel carwheels	18.00

DETROIT

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 heavy melting	16.25 to 16.75
No. 2 heavy melting	15.25 to 15.75
Borings and turnings	11.25 to 11.75
Machine shop turnings	10.75 to 11.25
Long turnings	9.75 to 10.25
Short shov. turnings	11.75 to 12.25
No. 1 cast	19.50 to 20.00
Automotive cast	19.50 to 20.00
Hvy. breakable cast.	16.00 to 16.50
Stove plate	11.50 to 12.00
Hydraul. comp. sheets	17.75 to 18.25
New busheling	16.25 to 16.75
Sheet clips	13.75 to 14.25
Flashings	16.25 to 16.75
Low phos. plate	18.50 to 19.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	15.50 to 16.00
No. 2 hvy. mltng. steel	14.50 to 15.00
Hvy. breakable cast.	18.00 to 18.50
No. 1 machinery cast.	18.50 to 19.00
No. 2 cast	16.50 to 17.00
Stove plate	15.00 to 15.50
Steel car axles	23.00 to 23.50
Shafting	20.00 to 20.50
No. 1 RR wrought	17.50 to 18.00
No. 1 wrought long	17.00 to 17.50
Spec. iron & steel pipe	12.00 to 12.50
Rails for rolling	19.00 to 19.50
Clean steel turnings*	10.00 to 10.50
Cast borings*	11.00 to 11.50
No. 1 blast furnace	9.00 to 9.50
Cast borings (chem.)	11.00 to 11.50
Unprepared yard scrap	9.50 to 10.00
Light iron	7.00 to 7.50

Per gross ton delivered local foundries:

No. 1 machin. cast.	20.50 to 21.00
No. 2 cast	17.00 to 17.50

* \$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

Breakable cast	16.75 to 17.00
Machine shop turn.	9.00 to 9.50
Mixed bor. & turn.	8.65 to 9.75
Bun. skeleton long	13.00 to 13.25
Shafting	19.00 to 19.50
Stove plate	13.75 to 14.00
Cast bor. chemical	10.75 to 11.25

Per gross ton delivered consumers' yards:

Textile cast	22.00 to 24.50
No. 1 machine cast	22.00 to 24.00

Per gross ton delivered dealers' yards:
Unprepared yard scrap \$11.00 to \$12.00

PACIFIC COAST

Per net ton delivered to consumer:

	San Fran.	Los Ang.	Seattle
No. 1 hvy. mltng. steel			Nominal
No. 2 hvy. mltng. steel			
Bundles			

CANADA

Dealers' buying prices at these yards, per gross ton:

Toronto		Montreal
Low phos. steel	14.00	13.00
No. 1 hvy. mltng. steel	12.50	11.50
No. 2 hvy. mltng. steel	10.50	9.50
Mixed dealers steel	8.75	7.75
Drop forge flashings	10.50	9.50
New loose clippings	8.75	8.25
Busheling	6.00	5.50
Scrap pipe	7.75	7.25
Steel turnings	9.00	8.00
Cast borings	9.00	8.00
Machinery cast	24.75	23.75
Dealers' cast	22.50	21.50
Stove plate	19.50	18.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered barges	
No. 1 hvy. mltng. steel	16.50
No. 2 hvy. mltng. steel	15.50
No. 2 cast	17.50
Stove plate	16.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel	17.25
No. 2 hvy. mltng. steel	15.75
Rail (scrap)	17.25 to 17.50
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel	Nominal
No. 2 hvy. mltng. steel	Nominal

Construction Steel

...STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

Fabricated Steel

Structural steel lettings are slightly lower at 23,850 tons; new projects declined to 29,850 tons from 33,655 tons last week; plate awards only 850 tons.

AWARDS

NORTH ATLANTIC STATES

- 3500 Tons, Quincy, Mass., Bethlehem Fore River shipbuilding plant; turret, armor and machine shops, to Bethlehem Steel Co., Bethlehem, Pa.
1000 Tons, Middle River, Md., hangars for Glenn L. Martin Co., to Ingalls Iron Works Co., Birmingham.
800 Tons, Niagara Falls, N. Y., furnace and crusher buildings for International Graphite & Electrode Corp., to Bethlehem Steel Co., Bethlehem, Pa.
600 Tons, Chester, Pa., unit No. 6, Philadelphia Electric Co., to Lehigh Structural Steel Co., Allentown, Pa.
465 Tons, Warren County, N. Y., highway bridge, to Phoenix Bridge Co., Phoenixville, Pa.
260 Tons, Iona Island, N. Y., storage building, to an unnamed fabricator.
200 Tons, Portsmouth, N. H., Navy Yard, three warehouses to Bethlehem Fabricators, Inc., Bethlehem, Pa., through Wag-horne-Brown Co., Boston.
200 Tons, Philadelphia, alterations to Art Museum, to Frank M. Weaver, Lansdale, Pa.
165 Tons, Monroe County, Pa., highway bridge, to Anthracite Bridge Co., Scranton, Pa.
165 Tons, Schenectady, N. Y., addition, axle shop and alterations, heat treating building for American Locomotive Co., to American Bridge Co., Pittsburgh.
100 Tons, Chester, Pa., mezzanine floor, unit No. 6, Philadelphia Electric Co., to Belmont Iron Works, Philadelphia.

THE SOUTH

- 230 Tons, Fort Smith, Ark., airport hangar, to Fort Smith Structural Steel Co., Fort Smith.

CENTRAL STATES

- 8700 Tons, Melrose Park, Ill., aircraft engine plant for Buick Motor Co., to Mississippi Valley Structural Steel Co., St. Louis.
2200 Tons, Flint, Mich., car storage and drive-away building for Buick Motor Co., to R. C. Mahon Co., Detroit.
550 Tons, Grosse Ile, Mich., Navy hangars, to Bethlehem Steel Co., Bethlehem, Pa.
374 Tons, South Amana, Iowa, State highway bridge, to Clinton Bridge Works, Clinton, Iowa.
360 Tons, Columbus, Ohio, building for Columbus Mutual Life Insurance Co., to Case Crane & Kilbourne Jacobs Co., Columbus.
300 Tons, Erie, Kan., bridge, A-122.5, for Missouri-Kansas-Texas Railroad Co., to American Bridge Co., Pittsburgh.

- 225 Tons, Kinsley, Kan., State highway bridge, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.
200 Tons, Canton, Ohio, storehouse for Kroger Grocery & Baking Co., to American Bridge Co., Pittsburgh.
190 Tons, Kalamazoo, Mich., storage building for Upjohn Co., to Mississippi Valley Structural Steel Co., St. Louis.

WESTERN STATES

- 500 Tons, Wilmington, Cal., California Shipbuilding Co. plate shop, to Consolidated Steel Corp., Los Angeles.
450 Tons, Sunnyvale, Cal., Joshua Hendy Iron Works addition, to Judson-Pacific Co., San Francisco.
350 Tons, San Diego, Cal., S. H. Kress & Co. store, to Pacific Iron & Steel Co., Los Angeles, through Joshua H. Marks-Charde Co., Los Angeles, contractor.
350 Tons, Fresno, Cal., Western Pipe & Steel Co. plant, to Western Pipe & Steel Co., San Francisco.
350 Tons, Berkeley, Cal., University of California cyclotron building, to Moore Dry Dock Co., Oakland, Cal.
320 Tons, San Leandro, Cal., Chrysler Corp. warehouse, to Judson-Pacific Co., San Francisco.
200 Tons, Oakland, Cal., Moore Dry Dock Co. shop, to Herriek Iron Works, Oakland, Cal.
165 Tons, Los Angeles, Whitney telephone building, to Consolidated Steel Corp., Los Angeles.
125 Tons, Keyport, Wash., Navy torpedo station building (Specification 10,140), to Isaacson Iron Works, Seattle, through J. W. Bailey, Seattle, contractor.
125 Tons, Tiburon, Cal., Navy net depot, repair wharf, to Columbia Steel Co., San Francisco, through J. Philip Murphy Corp., San Francisco.
100 Tons, Seattle, Sand Point Naval Air Station building, to Isaacson Iron Works, Seattle, through Austin Co., Seattle, contractor.

- 225 Tons, Illion, N. Y., office building for Remington-Rand Co.
175 Tons, New Kensington, Pa., additions to exchange building for Bell Telephone Co.
120 Tons, Springfield, Mass., bridge for Army Department.
110 Tons, Elmira, N. Y., warehouse for Thatcher Mfg. Co.
100 Tons, Buffalo, addition for Worthington Pump & Machinery Co.p.

THE SOUTH

- 3000 Tons, Milan, Tenn., ordnance plant, bids taken Feb. 19.
3000 Tons, Norfolk, Ark., construction trestle, Norfolk Dam, for Government.

CENTRAL STATES

- 7000 Tons, bridge across Mississippi River at Dubuque, Iowa; plans ready soon.
3500 Tons, Euclid, Ohio, manufacturing building, etc., for Defense Plant Corp.
900 Tons, St. Paul, Minn., State bridge No. 5950.
600 Tons, Flint, Mich., addition to sheet metal plant No. 10 for Chevrolet Motor Division, GMC.
550 Tons, various locations, bridges and repairs for Milwaukee Road.
325 Tons, Youngstown, Ohio, central office building for Ohio Bell Telephone Co.; bids in.
125 Tons, Montezuma, Ind., State bridge, contract No. 2124.
115 Tons, States of Illinois and Indiana, repairs to railroad bridges.

WESTERN STATES

- 2000 Tons, Mare Island, Cal., quay wall and pier at Navy Yard; Henry J. Kaiser Co., Oakland, Cal., contractor.
150 Tons, Hawthorne, Nev., torpedo storage building, ammunition depot, for Navy Department.

HAWAII

- 500 Tons, Honolulu, terminal shed.

FABRICATED PLATES

AWARDS

- 850 Tons, St. Paul, Minn., six oil tanks for Globe Oil Co., to Chicago Bridge & Iron Co., Chicago.

PENDING PROJECTS

- 200 Tons, Mare Island, Cal., Navy schedule 5234; bids Feb. 21.

SHEET PILING

PENDING PROJECTS

- 800 Tons, Cleveland, Cuyahoga River turning basin; Great Lakes Dredge & Dock Co. general contractor.
395 Tons, Paducah, Ky., Government dam project; C. E. Carson Co., Chicago, general contractor.

Weekly Bookings of Construction Steel

Week Ended	Feb. 18,	Feb. 11,	Jan. 21,	Feb. 20,	Year to Date	
	1941	1941	1941	1940	1941	1940
Fabricated structural steel awards	23,850	25,500	55,750	21,700	253,400	118,460
Fabricated plate awards	850	2,350	12,485	800	23,045	20,025
Steel sheet piling awards	0	0	540	2,135	3,250	4,485
Reinforcing bar awards	6,050	13,570	10,015	6,200	70,640	54,120
Total Letting of Construction Steel	30,750	41,420	78,790	30,835	350,335	197,090

Reinforcing Steel

Awards of 6,050 tons; 20,250 tons in new projects.

AWARDS

ATLANTIC STATES

- 900 Tons, Brooklyn, Coney Island sewage works, contract No. 5, to Bethlehem Steel Co., Bethlehem, Pa., through E. W. Foley, Inc.
700 Tons, Philadelphia, Chester housing project, to American Steel Engineering Co., Philadelphia, through Stofflet & Tillotson, Philadelphia, general contractors.
297 Tons, Brooklyn, bars for Prospect Avenue grade separation, to Truscon Steel Co., Youngstown, through Ross Galvanizing Works and Craven Construction Co.
200 Tons, Aberdeen, Md., army cantonment, to Bethlehem Steel Co., Bethlehem, Pa., Irwin & Leighton, contractors.
150 Tons, Hartford factory for Veeder Root, Inc., to Republic Steel Corp., Cleveland, through Scherer Steel Co., Industrial Construction Co., contractor.
100 Tons, Farmingdale, Long Island, mesh for Republic Aviation Co., to Truscon Steel Co., Youngstown, through Fireproof Products Co.

SOUTH AND CENTRAL

- 395 Tons, Bay City, Mich., bars for Consumers Power Co., to Truscon Steel Co., Youngstown, Ohio.
355 Tons, Akron, Ohio, bars for Ohio Edison Co., to Truscon Steel Co., Youngstown.
177 Tons, Woodson County, Kan., bridge, to Laclede Steel Co., St. Louis.
163 Tons, Medaryville, Ind., bridge No. 2070, to Olney J. Dean Steel Co., Cicero, Ill.; Stuntz-Yeoman, contractor.
104 Tons, Levy, Ark., bridge 2071, to Jones & Laughlin Steel Co., Pittsburgh.
100 Tons, Portsmouth, Va., naval ammunition depot, to Virginia Steel Co., Richmond, Va.
100 Tons, East Chicago, Ind., Sinclair Refining Co. plant, to Joseph T. Ryerson & Son, Inc., Chicago; Person Construction Co., contractor.
100 Tons, Saginaw, Mich., bars for River Street collecting sewer, to Truscon Steel Co., Youngstown, through Ripslinger Bros.

WESTERN STATES

- 1800 Tons, Oakland, Cal., Navy aviation storage buildings superstructure, to Ceco Steel Products Co., San Francisco, through Clinton Construction Co., San Francisco, contractor.
145 Tons, Oeden, Utah, Ogden Ordnance Depot, additional ammunition loading facilities, to Colorado Builders Supply Co., Denver, through Olson Construction Co. and Dobson & Robinson, Lincoln, Neb., contractors.
100 Tons, Richmond, Cal., Todd-California Corp. shipyard, to Ceco Steel Products Co., San Francisco.

COSTA RICA

- 160 Tons, Costa Rica, FWA Invitation CR-10, to Joseph T. Ryerson & Son, Inc., Chicago.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

- 800 Tons, Baltimore, Coast Guard shipway and drydock; bids taken.
700 Tons, Washington, Statler Corp. hotel; J. W. Harris Associates, contractors.
700 Tons, Brooklyn, Navy Yard receiving barracks; White Construction Co., contractors.
280 Tons, Washington, New York Avenue viaduct; bids in.

SOUTH AND CENTRAL

- 3300 Tons, Radford, Va., Hercules Powder Co. bagging plant; Mason & Hangar, general contractor.
400 Tons, Paducah, Ky., Government dam project; C. E. Carson Co., Chicago, general contractors.
340 Tons, Williamsburg, Va., Colonial National Park bridge; bids Feb. 21.
240 Tons, Fort Branch, Ind., Emge Packing Co. cold storage building; bids taken.
150 Tons, Minneapolis, Atkinson Milling Co.
130 Tons, Detroit, Fort Wayne Army post warehouse.

WESTERN STATES

- 5200 Tons, Hermiston, Ore., igloos, Army Ordnance Depot; J. A. Terteling & Son, Boise, Idaho, contractor.
5000 Tons, Fort Wingate, N. M., igloos, Army Ordnance Depot; Sharp & Fellows, Los Angeles, contractor.
967 Tons, Tucumcari, N. M., Tucumcari project (Invitation 32,992-A); bids in.

693 Tons, Coram, Cal., Kennett division, Central Valley project (Invitation A-33,162-A); bids Feb. 21.

275 Tons, Benson, Ariz., State highway underpass; bids Feb. 21.

158 Tons, Berkeley, Cal., University of California emergency classroom building; Empire Construction Co., San Francisco, low bidder.

121 Tons, Bellflower, Cal., San Gabriel River bridge; bids Feb. 27.

100 Tons, Los Angeles, city schedule 4191; bids in.

HAWAII

685 Tons, Fort Shafter, barracks C and D (Invitation QM-6812-41-44); bids in.

Cast Iron Pipe

Water Department, Columbus, Ohio, Clarence Hoover, superintendent, plans about 2200 ft. of 16-in. pipe, 2600 ft. of 12-in., and 42,800 ft. of 8-in. for extensions in main water lines. Cost about \$225,000. Financing is being arranged through Federal aid.

Village Council, Pepin, Wis., Douglas Ingalls, clerk, asks bids until Feb. 28 for 4800 ft. of 8-in. pipe, 19,530 ft. of 6-in., 1947 ft. of 4-in., and 2990 ft. of 2-in.; also for gate valves, hydrants, water meters, fittings, etc. Frank J. Davy & Son, La Crosse, Wis., are consulting engineers.

Water Department, Long Beach, Cal., G. R. Wade, general manager, plans about 5900 ft. of 16-in. pipe, and 7700 ft. of 12-in. for main water supply from point near West city boundary to Terminal Island site of Fleet Operating Base. Cost about \$70,000. Financing in part will be arranged through Federal aid.

Tumwater, Wash., plans about 25,000 ft. of 1½ to 8-in. pipe for extensions and replacements in water system. Cost about \$42,800. Financing is being arranged through Federal aid.

Bogalusa, La., plans pipe line extensions and improvements in water system. Special election has been called March 11 to vote bonds for \$326,000 for this and sewage system.

Public Utilities Commission, Manitowoc, Wis., asks bids until Feb. 27 for 24-in. main water line under Manitowoc River at Ninth Street.

Maryland Heights Water District No. 2, Maryland Heights, Mo., plans pipe lines for water system in district near Fee Fee and Dorsett Roads. Cost about \$45,000. Special election has been called Feb. 25 to approve bonds for \$25,000, remainder of fund to be secured through Federal aid. Robert Francis Denny Co., 8004 Bonhomme Street, Clayton, Mo., is consulting engineer.

Water Department, Allentown, Pa., plans about 7300 ft. of 12, 8 and 6-in. for main water lines in parts of Constitution Drive, Muhlenberg, Madwell, Washington and other streets. Cost over \$75,000.

River Road Water District, Eugene, Ore., will take bids Feb. 27 on 5148 ft. of 10-in. pipe, 1865 ft. of 8-in., 24,880 ft. of 6-in., 29,955 ft. of 4-in., and 5217 ft. of 2-in.; also material not indicated. 6000 ft. of ¾-in. galvanized pipe, 1000 ft. of ¾-in. copper pipe, fittings, valves, hydrants, meters, and accessories will be purchased. C. E. Mercer, 861 Willamette Street, Eugene, is agent for district.

Menlo Park Water District, care of George E. Birnie, Spalding Building, Portland, Ore., will take bids March 3 on 8000 ft. of 8-in. pipe, 12,000 ft. of 6-in., 7000 ft. of 4-in., and 10,500 ft. of 2-in.; also material not indicated, and valves, valve boxes, fittings and accessories. John W. Cunningham, Spalding Building, Portland, is engineer.

Newport Beach, Cal., has opened bids on 2300 ft. of 20-in. pipe. Alternate bids were taken on steel, cast iron, and asbestos-cement.

Bishop, Cal., has awarded 400 tons of 4 to 12-in. pipe to United States Pipe & Foundry Co., San Francisco.

United States Engineer, Portland, will take bids on 9700 ft. of 12-in. pipe for line from Northeast 42nd and Killingsworth Streets, to Portland Columbia airport for Army cantonment.

No Price-Fixing Conspiracy If Government Directs—Arnold

Washington

• • • Assistant Attorney General Thurman Arnold, head of the Justice Department anti-trust division, said on Tuesday that the anti-trust laws cannot be interpreted as a deterrent to national defense. He laid down these guides for business groups who have been asked to adhere to certain price ceilings and for those who have been asked to cooperate under government priority machinery:

1. Where business men have been directed by a government agency to take certain action, and each of those business men obeys, there is no conspiracy under the anti-trust laws.

2. But if a government agency delegated to these business men the power to fix prices and priorities, that would be an unconstitutional delegation of authority and in violation of the Sherman Act.

3. The anti-trust laws in effect compel government defense bureaus to take the responsibility of giving necessary directions in price and priority matters by doing it in public, in the open, so that the directions are constantly subject to public examination.

Mr. Arnold's statement was made before the Temporary National Economic Committee after Wayne C. Taylor, Undersecretary of Commerce, told the committee that it should make no recommendations which should slow down the defense program.

Both Mr. Arnold and Committee Chairman Joseph C. O'Mahoney protested, insisting that the committee should recommend a vigorous program of anti trust enforcement despite the armament program.

Republic Votes 50c. Dividend

• • • Directors of Republic Steel Corp. on Feb. 17 declared a dividend of \$1.50 per share on the 6 per cent cumulative convertible prior preference stock, series A, and a dividend of \$1.50 per share on the 6 per cent cumulative convertible preferred stock payable April 1, to stockholders of record March 10.

A dividend of 50c. per share was declared on the common stock of the corporation, payable April 2, to stockholders of record March 10.

Prices of Finished Iron and Steel...

Steel prices on these pages are f.o.b. basing points (in cents per lb.) unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point ↓ Product													DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cora	Pacific Ports, Cora	Detroit	New York	Phila- delphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled ¹	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	
Long ternes ²	3.80¢		3.80¢									4.55¢			
Wrought iron	4.75¢														
STRIP															
Hot rolled ³	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢		
Cold rolled ⁴	2.80¢	2.90¢		2.80¢			2.80¢		(Worcester = 3.00¢)				2.90¢		
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢								
Commodity C-R	2.95¢			2.95¢			2.95¢		(Worcester = 3.35¢)				3.05¢		
TIN PLATE															
Standard cokes (Per 100-lb. base box)	\$5.00	\$5.00	\$5.00						\$5.10						
BLACK PLATE															
29 gage ⁵	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (10)			
TERNES, M'FG.															
Special coated (Per base box)	\$4.30		\$4.30						\$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			(Duluth = 2.25¢)		2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel ⁶	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢		
Reinforcing (rail) ⁷	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢				2.40¢	2.45¢	2.15¢		
Cold finished ⁸	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢				(Detroit = 2.70¢)					
PLATES										(Coatesville and Claymont = 2.10¢)					
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			2.45¢	2.65¢		2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	
Alloy	3.50¢	3.50¢				(Coatesville = 3.50¢)									
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			(Bethlehem = 2.10¢)		2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢					(Worcester = 3.00¢)						
0.51 to 0.75 Carbon	4.30¢			4.30¢					(Worcester = 4.50¢)						
0.76 to 1.00 Carbon	6.15¢			6.15¢					(Worcester = 6.35¢)						
1.01 to 1.25 Carbon	8.35¢			8.35¢					(Worcester = 8.55¢)						
WIRE⁹															
Bright	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)						
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)						
Spring	3.20¢	3.20¢		3.20¢					(Worcester = 3.30¢)						
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			
IRON BARS															
Common		2.25¢				(Terre Haute, Ind. = 2.15¢)									
Refined	3.75¢														
Wrought	4.40¢														

¹ Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. ² Unassorted 8-lb. coating. ³ Widths up to 12 in. ⁴ Carbon 0.25 per cent and less. ⁵ Applies to 29 gage within certain width and length limitations. ⁶ For merchant trade. ⁷ Straight lengths as quoted by distributors. ⁸ Also shafting. For quantities of 20,000 to 39,999 lb. ⁹ Carload lots to manufacturing trade. ¹⁰ Boxed.

PRICES

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher f.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton
Rerolling \$34.00
Forging quality 40.00

Shell Steel

Basic open hearth shell steel f.o.b. Pittsburgh and Chicago.

Per Gross Ton
3 in. to 12 in. \$52.00
12 in. to 18 in. 54.00
18 in. and over 56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity. This type of steel is for hot rolled sections used for the forging of shells and includes rounds, round squares, and special sections.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open hearth or bessemer \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared. 1.90c.

Wire Rods

(No. 5 to 9/32 in.) Per Lb.
Pittsburgh, Chicago, Cleveland. 2.00c.
Worcester, Mass. 2.10c.
Birmingham 2.00c.
San Francisco 2.50c.
Galveston 2.25c.
9/32 in. to 4/64 in., \$3 a net ton higher. Quantity extras apply.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh; Package, 112 Sheets)

20x14 in. 20x28 in.
8-lb. coating I.C. \$6.00 \$12.00
15-lb. coating I.C. 7.00 14.00
20-lb. coating I.C. 7.50 15.00
25-lb. coating I.C. 8.00 16.00
30-lb. coating I.C. 8.63 17.25
40-lb. coating I.C. 9.75 19.50

WIRE PRODUCTS

(To the Trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

Base per Keg
Standard wire nails \$2.55
Coated nails 2.55
Cut nails, carloads 3.85

Base per 100 Lb.
Annealed fence wire \$3.05

Base Column
Woven wire fence* 67
Fence posts (carloads) 69
Single loop bale ties 56
Galvanized barbed wire† 70
Twisted barbless wire 70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

Note: Birmingham base same on above items, except spring wire.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
½ in. and smaller by 6 in. and shorter 68
9/16 and 5/8 in. by 6 in. and shorter 66
¾ to 1 in. by 6 in. and shorter 64
1½ in. and larger, all lengths 62
All diameters over 6 in. long 62
Lag, all sizes 65

Plow bolts 68½
Hot pressed nuts; c.p.c., t-nuts; square, hex., blank or tapped:
½ in. and smaller 66
9/16 to 1 in. inclusive 63
1½ to 1½ in. inclusive 61
1½ in. and larger 60

On above items, excepting plow bolts, additional allowance of 10 per cent for full container quantities.

On all of the above items there is an additional 5 per cent allowance for carload shipments.

Semi-fin. hexagon nuts U.S.S. S.A.E.
½ in. and smaller 66 70
9/16 to 1 in. 63 65
1½ in. through 1½ in. 61 62
1½ in. and larger 60

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose 73 and 100

Stove bolts in packages, with nuts attached 73

Stove bolts in bulk 81

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York, lots of 200 lb. or over.

Large Rivets

(½ in. and larger)

Base per 100 Lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham \$3.40

Small Rivets

(7/16 in. and smaller)

Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 65 and 10

Cap and Set Screws

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller 50
Milled headless set screws, cut thread ¼ in. and larger 64
3/16 in. and smaller 73
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller 68
Upset set screws, cup and oval points 74
Milled studs 52

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Feb. 13	Feb. 14	Feb. 15	Feb. 17	Feb. 18
Copper, Electrolytic¹	12.00	12.00	12.00	12.00	12.00
Copper, Lake	12.00	12.00	12.00	12.00	12.00
Tin, Straits, New York	50.625	51.00		51.50	51.75
Zinc, East St. Louis	7.25	7.25	7.25	7.25	7.25
Lead, St. Louis²	5.35	5.35	5.35	5.50	5.50

¹ Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Products

Cents per lb., Delivered

	New York	Cleveland
Tin		
Straits pig	52.75	54.00
Copper		
Electro	12.75	14.00
Castings	12.50	13.50
H. R. Sheets*	20.12	20.12
Seamless tubes*	20.62	20.62
Brass		
Yellow sheets*	18.65	18.65
Yellow, rods*	13.67	13.67
Seamless tubes*	21.40	21.40
Zinc		
Slabs	Nom'al	Nom'al
Sheet, No. 9 casks	13.50	Nom'al
Lead		
American pig	6.65	6.15
Bar	8.60	8.65
Cut sheets	8.90	8.90
Antimony		
Asiatic	16.00	17.00
Aluminum		
Virgin, 99%	20.00	21.00
No. 1 remelt, 98-99%	18.00	18.50
Solder		
½ and ½	31.575	32.375
Babbitt		
Anti-friction grade	23.50	21.75

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper		
Hvy. crucible	10.50	11.125
Hvy. and wire	9.50	9.90
Light and bottoms	8.50	9.00
Brass		
Heavy	6.50	7.00
Light	5.50	6.25
No. 1 yel. turn	6.00	6.50
No. 1 red or compo.		
turnings	9.25	10.25
Hvy. Mach. compo	9.50	9.875
Lead		
Heavy	4.50	5.00
Aluminum		
Cast	Nom'l	Nom'l
Sheet	Nom'l	Nom'l
Zinc	Nom'l	Nom'l

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 17c.-18c. a lb.; No. 12 remelt No. 2, standard, 17-17.50c. a lb. NICKEL electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt: Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. QUICK-SILVER, \$169-\$170 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 13.25c. a lb.

*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33¼; on brass sheets and rods, 40; on brass tubes, 33¼, and copper tubes, 40.

PRICES

ALLOY STEEL

Alloy Steel Blooms, Billets and Slabs

Base per gross ton, f.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem\$54.00

Alloy Steel Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade..... 2.70c.
Delivered, Detroit 2.80c.

S.A.E. Series Numbers Alloy Differential, per 100 Lb.
2000 (1.5 Ni)\$0.35

2100 (1.5 Ni)	0.75
2300 (3.5 Ni)	1.70
2500 (5 Ni)	2.55
3100 Ni-Cr	0.70
3200 Ni-Cr	1.35
3300 Ni-Cr	3.80
3400 Ni-Cr	3.20
4100 Cr-Mo (0.15 to 0.25 Mo.) ..	0.55
4100 Cr-Mo (0.25 to 0.40 Mo.) ..	0.75
x4340 Cr-Ni-Mo	1.70
4340 Cr-Ni-Mo	1.85
4600 Ni-Mo (0.2-0.3 Mo, 1.5-2 Ni)	1.20
5100 (0.60-0.90 Cr)	0.35
5100 (0.80-1.10 Cr)	0.45
5100 Cr spring steel	0.15
52-100 Cr. (electric furnace) ..	2.60
6100 Cr-V bar	1.20

6100 Cr-V spring steel.....	0.85
C-V	0.85

The above differentials are for hot rolled finished products. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. Delivered Detroit, 3.45c. carlots.

Alloy Steel Plates

Base per lb., f.o.b. Pittsburgh, Chicago and Coatesville.
Open hearth grade3.50c.

STAINLESS AND HEAT-RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chromium-Nickel

No.	304	302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes ..	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip.....	23.50c.	21.50c.
Cold rolled strip ..	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium

No.	410	430	442	446
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
H'tstrip	17.00c.	17.50c.	24.00c.	35.00c.
C'd st.	22.00c.	22.50c.	32.00c.	52.00c.

TOOL STEEL

(F.o.b. Pittsburgh)

	Base per Lb.
High speed	67c.
High-carbon-chromium	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

ELECTRICAL SHEETS

(F.o.b. Pittsburgh)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72 ..	6.15c.
Transformer 65 ..	7.15c.
Transformer 58 ..	7.65c.
Transformer 52 ..	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago ..	\$54.80
6-in. and larger, del'd New York ..	52.20
6-in. and larger, Birmingham ..	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle	56.00

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago.

CHICAGO PNEUMATIC CUTS SIZE and Weight of Angle Heads with TORRINGTON NEEDLE BEARINGS



"The small size of Torrington Needle Bearings permits substantial reduction in dimensions of our Angle Head tools," declares J. E. Olson, engineer of Chicago Pneumatic Tool Company. The anti-friction Needle Bearings (shown above on an Angle Head drive shaft) occupy no more space than a

plain bushing—yet carry heavy loads at high speeds with great efficiency and long life, for radial capacity is extremely high in proportion to size.

"And they require no extra lubrication systems," add Chicago Pneumatic's engineers, "because large supplies of grease are retained within the close-fitting lips of the race"—a special advantage for bearings in hard-to-reach spots.

Torrington Needle Bearings are quickly installed at low cost because they are self-contained units. Another advantage: initial costs are surprisingly small.

Are you seeking ways to improve your product's efficiency while keeping costs and space requirements low? The extraordinarily compact, high-capacity Torrington Needle Bearing may be the answer to your problem. Our Engineering Department will gladly help you plan the inclusion of its advantages in your product. For more detailed information, write for Catalog No. 104. For Needle Bearings to be used in heavier service, ask our associate, Bantam Bearings Corporation, South Bend, Ind., for a copy of Booklet 103X.



THE TORRINGTON COMPANY, TORRINGTON, CONN., U.S.A. • ESTABLISHED 1866

Makers of Needle and Ball Bearings

New York Boston Philadelphia Detroit Cleveland Chicago London, England

TORRINGTON NEEDLE BEARING

PRICES

BOILER TUBES

Seamless Steel and Lap Weld Commercial
Boiler Tubes and Locomotive Tubes.
Minimum Wall

(Net base prices per 100 ft., f.o.b. Pitts-
burgh, in carload lots)

	Seamless	Lap Weld, Cold Hot Drawn Rolled Rolled
1 in. o.d.13 B.W.G.	\$9.01	\$7.82
1 1/4 in. o.d.13 B.W.G.	10.67	9.26
1 1/2 in. o.d.13 B.W.G.	11.70	10.23
1 3/4 in. o.d.13 B.W.G.	13.42	11.64
2 in. o.d.13 B.W.G.	15.03	13.04
2 1/4 in. o.d.13 B.W.G.	16.76	14.54
2 1/2 in. o.d.12 B.W.G.	18.45	16.01
2 3/4 in. o.d.12 B.W.G.	20.21	17.54
3 in. o.d.12 B.W.G.	22.48	19.50
3 1/2 in. o.d.11 B.W.G.	28.37	24.62
4 in. o.d.10 B.W.G.	35.20	30.54
4 1/2 in. o.d.10 B.W.G.	43.04	37.35
5 in. o.d. 9 B.W.G.	54.01	46.87
6 in. o.d. 7 B.W.G.	82.93	71.96

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District
and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought iron
pipe)

Base Price = \$200 Per Net Ton

Butt Weld

Steel	Black	Galv.
1/8 in.	56	36
1/4 to 3/8 in.	59	43 1/2
1/2 in.	63 1/2	54
3/4 in.	66 1/2	58
1 to 3 in.	68 1/2	60 1/2

Wrought Iron

	Black	Galv.
1/4 and 3/8 in.	+9	+10
1/2 in.	24	6 1/2
3/4 in.	30	13
1 and 1 1/4 in.	34	19
1 1/2 in.	38	21 1/2
2 in.	37 1/2	21

Lap Weld

Steel		
2 in.	61	52 1/2
2 1/2 and 3 in.	64	55 1/2
3 1/2 to 6 in.	66	57 1/4
7 and 8 in.	65	55 1/2
9 and 10 in.	64 1/2	55
11 and 12 in.	63 1/2	54

Wrought Iron

2 in.	30 1/2	15
2 1/2 to 3 1/2 in.	31 1/2	17 1/2
4 in.	33 1/2	21
4 1/2 to 8 in.	32 1/2	20
9 to 12 in.	28 1/2	15

Butt weld, extra strong, plain ends

Steel	Black	Galv.
1/8 in.	54 1/2	41 1/2
1/4 to 3/8 in.	56 1/2	45 1/2
1/2 in.	61 1/2	53 1/2
3/4 in.	65 1/2	57 1/2
1 to 3 in.	67	60

Wrought Iron

	+10	+43
1/4 and 3/8 in.	25	9
1/2 in.	31	15
3/4 in.	38	22 1/2

Lap weld, extra strong, plain ends

Steel		
2 in.	59	51 1/2
2 1/2 and 3 in.	63	55 1/2
3 1/2 to 6 in.	66 1/2	59

	Black	Galv.
7 and 8 in.	65 1/2	56
9 and 10 in.	64 1/2	55
11 and 12 in.	63 1/2	54

Wrought Iron

2 in.	33 1/2	18 1/2
2 1/2 to 4 in.	39	25 1/2
4 1/2 to 6 in.	37 1/2	24
7 and 8 in.	38 1/2	24 1/2
9 to 12 in.	32	20 1/2

On butt weld and lap weld steel pipe
jobbers are granted a discount of 5%. On
less-than-carload shipments prices are de-
termined by adding 25 and 30% and the
carload freight rate to the base card.

F.o.b. Gary prices are two points lower
discount or \$4 a ton higher than Pitts-
burgh or Lorain on lap weld and one
point lower discount, or \$2 a ton higher,
on all butt weld 8 in. and smaller.

Introducing— TWO NEW NON-CORROSIVE ALLOYS

● Super B&M METAL

—Super B & M Metal Is Improved Aluminum
Bronze.

● Stainless B&M METAL

—Stainless B & M Metal is a high Nickel Alloy—
containing approximately 30% nickel.

PHYSICAL QUALITIES OF HOT ROLLED AND FORGED

	SUPER B&M METAL	STAINLESS B&M METAL
Diameter of Bar	.505	.505
Area	.2003	.2003
Yield Point, lbs. per sq. in.	55830	74800
Tensile Strength, lbs. per sq. in.	91700	91580
Elongation in 2"	38.5%	28.5%
Reduction of Area	46.7	70.8
Fracture	3/4 Cup	3/4 Cup
Specific Gravity	7.75	8.85
Weight per Cubic Inch	0.280	0.320

BOTH ARE AVAILABLE IN HOT ROLLED BARS — STRIP —

FORGINGS — BILLETS — CASTINGS

WRITE TODAY FOR COMPLETE BOOKLET

WHEELING BRONZE CASTING CO.



WHEELING, W. VA.

PRICES

ORES

Lake Superior Ores

*Delivered Lower Lake Ports
Per Gross Ton*

Old range, bessemer, 51.50%...	\$4.75
Old range, non-bessemer, 51.50%	4.60
Mesaba, bessemer, 51.50%	4.60
Mesaba, non-bessemer, 51.50%	4.45
High phosphorus, 51.50%	4.35

Foreign Ores*

*C.A.f. Philadelphia or Baltimore,
Exclusive of Duty*

	<i>Per Unit</i>
African, Indian, 44 to 48% Mn...	.57c.

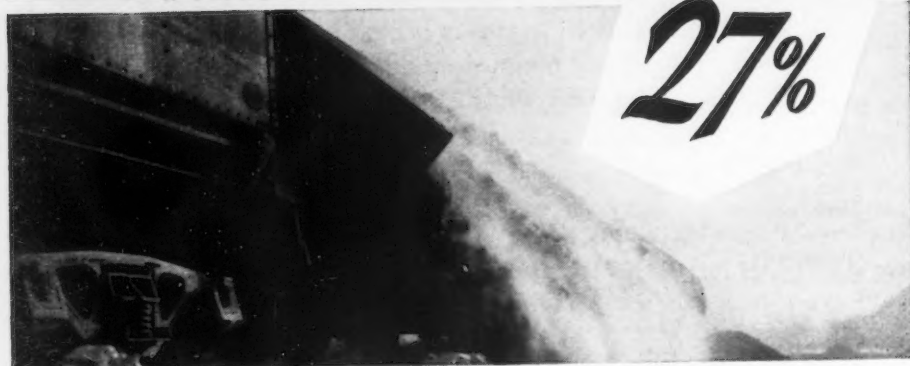
African, Indian, 49 to 51% Mn...	.60c.
Brazilian, 46 to 48% Mn.....	.54c.
Cuban, del'd, duty free, 51% Mn.	.67½c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered ...	\$23 to \$24
Tungsten, domestic, scheelite, delivered	\$23.00
Chrome ore, lump c.i.f. Atlantic Seaboard, per gross ton: South African (low grade).....	Nom.
Rhodesian, 45%	\$25.00
Rhodesian, 48%	\$28.00 to \$30.00



DECREASE YOUR WASTE DISPOSAL COSTS



27%

This big 50 cu. yard Automatic Air Dump car has shown a decrease of as much as 27% in waste disposal costs under actual mill service conditions. It's "big" all over; holds a 65 yard normal load and quickly, automatically dumps to either side. Similar savings can be yours. Why not have a Koppel engineer give you the facts?

KOPPEL

**Interesting performance figures on the Koppel
50 yd. Automatic Air Dump Car will be sent
you on request.**

PRESSED STEEL CAR CO., INC.

(KOPPEL DIVISION)

NEW YORK PITTSBURGH CHICAGO

RAILS, TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., gross ton.....	\$40.00
Angle bars, 100 lb.....	2.70

F.o.b. Basing Points

Light rails (from billets), gross ton	\$40.00
Light rails (from rail steel), gross ton	39.00

Base per Lb.

Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast.....	2.30c.
Track bolts, steam railroads...	4.15c.
Track bolts, discount to jobbers all sizes (per 100 counts)....	65-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapqua, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR *Per Net Ton*

Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail... \$20.00 to \$21.00	
Domestic, f.o.b. Ohio River land- ing barges	20.00 to 21.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines..	20.00 to 21.00
Foreign, 85% calcium fluoride, not over 5% Si., c.i.f. Atlantic ports, duty paid	Nominal
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illi- nois and Kentucky mines....	31.00
As above, in bags, f.o.b. same mines	32.60

REFRACTORIES

Fire Clay Brick *Per 1000 f.o.b. Works*

Super-duty brick at St. Louis..	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey....	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Mis- souri and Illinois.....	42.75
Second quality, New Jersey....	49.00
No. 1 Ohio.....	39.90
Ground fire clay, per ton	7.10

Silica Brick

Pennsylvania	\$47.50
Chicago District	55.10
Birmingham	47.50
Silica cement, net ton (Eastern)	8.55

Chrome Brick

Net per Ton

Standard f.o.b. Baltimore, Plym- outh Meeting and Chester...	\$50.00
Chemically bonded f.o.b. Balti- more, Plymouth Meeting and Chester, Pa.	

Magnesite Brick

Standard f.o.b. Baltimore and Chester	\$72.00
Chemically bonded, f.o.b. Balti- more	61.00

Grain Magnesite

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	(—)*
Domestic, f.o.b. Baltimore and Chester in sacks	\$40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

*None available.

PRICES

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton
Domestic, 80% (carload).....\$120.00

Spiegeleisen

Per Gross Ton Furnace
Domestic, 19 to 21%.....\$36.00
Domestic, 26 to 28%..... 49.50

Electric Ferrosilicon

Per Gross Ton, Delivered, Lump Size
50% (carload lots, bulk).....\$74.50*
50% (ton lots, packed)..... 87.00*
75% (carload lots, bulk).....135.00*
75% (ton lots, packed).....151.00*

Bessemer Ferrosilicon

Per Gross Ton, F.o.b. Jackson, Ohio
10.00 to 10.50%.....\$34.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2% \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton, F.o.b. Jackson, Ohio
5.00 to 5.50%.....\$28.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots Lump Size, on Contract

4 to 6% carbon.....11.00c.
2% carbon.....17.50c.
1% carbon.....18.50c.
0.10% carbon.....20.50c.
0.06% carbon.....21.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon.....\$113.00*
2.50% carbon..... 118.00*
2% carbon..... 123.00*
1% carbon..... 133.00*

Other Ferroalloys

Ferrotungsten, per lb. contained W, del. carload..... \$2.00
Ferrotungsten, 100 lb. and less..... 2.25
Ferrovanadium, contract, per lb. contained V, del'd \$2.70 to \$2.90†
Ferrocolumbium, per lb. contained columbium f.o.b. Niagara Falls, N. Y., ton lots..... \$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace, carload and contract, per net ton.....\$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract per net ton.....\$157.50

*Spot prices are \$5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton..... 58.50

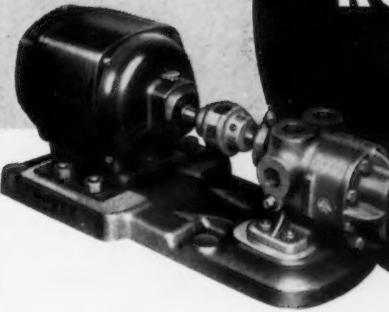
Ferrophosphorus, electrolytic 23-26% in carlots, f.o.b. Monsato (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville..... 75.00

Ferromolybdenum, per lb. Mo, f.o.b. furnace..... 95c.

Calcium molybdate, per lb. Mo, f.o.b. furnace..... 80c.
Molybdenum oxide briquettes 48-52% Mo, per lb. contained Mo, f.o.b. Langeloth, Pa. 80c.

FUEL OIL

No. 3, f.o.b. Bayonne, N. J.....4.30c.
No. 6, f.o.b. Bayonne, N. J.....2.98c.
No. 5 Bur. Stds., del'd Chicago..3.25c.
No. 6 Bur. Stds., del'd Chicago..2.75c.
No. 3 distillate, del'd Cleveland..5.50c.
No. 4 industrial, del'd Cleveland..5.25c.
No. 5 industrial, del'd Cleveland..5.00c.
No. 6 industrial, del'd Cleveland..4.75c.



ROPER

ROTARY PUMPS

for all
METAL WORKING INDUSTRIES

ONLY ROPER HAS ALL THESE FEATURES

- ★ **FOUR LARGE BEARINGS**—two on each side — are designed and constructed to handle peak loads and endure severe operating abuses.
- ★ **SPLINED DRIVE SHAFT** forms sliding joint with broached gear to absorb shock and thrust from power end.
- ★ **CONSTANT LUBRICATION** is assured by liquid being pumped and by inherent lubricating qualities of bearing metal used.
- ★ **WEAR PLATES** protect pump from foreign matter in liquid. Lengthen life of pump.
- ★ **ONE PIECE BACKPLATE** permits removal of all internal parts without disturbing piping or power unit.
- ★ **ALWAYS PRIMED** — once primed and in operation the ROPER will pick up its own prime instantly.

Thousands of ROPER ROTARY PUMPS are helping all kinds of metal working plants maintain production schedules.

Roper Pumps with sleeve bearings are built in sizes up to 1000 gals. per minute and for pressures up to 300 lbs. per square inch.

Roper Pumps with anti-friction bearings are built in 10, 15, 20, 35, 50 and 75 g.p.m. sizes to operate against 1000 lbs. pressure.

**DO YOU KNOW WHAT
THIS SEAL MEANS
TO PUMP USERS?**



If you'd like to find out write for the new Roper Catalog 932. It illustrates and describes ROPER "hydraulically balanced" PUMPS.

GEO. D. ROPER CORPORATION
Rockford, Illinois

ROPER Rotary PUMPS

DEPENDABLE - SINCE 1857

PRICES

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, prompt	\$5.25 to \$5.75
Foundry, f.o.b. Connellsville, prompt	\$5.50 to \$6.00
F'dry, by-product, Chicago	10.50
F'dry, by-product, New England	13.00
Foundry, by-product, Newark or Jersey City	\$11.30 to \$11.90
F'dry, by-product, Philadelphia	11.13
F'dry, by-product, Cleveland	11.55
F'dry, by-product, Cincinnati	11.00
Foundry, Birmingham	7.50
F'dry, by-product, St. Louis	\$10.75 to \$11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports	\$14.75

BRITISH

British

Per Gross Ton, f.o.b. United Kingdom Ports

Ferromanganese, export	£29 16s. 3d.
Tin plate, per base box	32s. to 33s.
Steel bars, open hearth	£16 10s.
Beams, open hearth	£15 8s.
Channels, open hearth	£15 8s.
Angles, open hearth	£15 8s.
Black sheets, No. 24, gage	£22 5s. max.* £22 5s. min.**
Galvanized sheets, No. 24 gage	£25 12s. 6d. max.*; £25 12s. 6d. min.**

*Empire markets only.

**Other than Empire markets.

PIG IRON (Per Gross Ton)

Prices delivered various consuming points indicated by bold italics

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phos.
Boston	\$25.50	\$25.00	\$26.50	\$26.00	.....
Brooklyn	27.50	.....	.....	28.00	.....
Jersey City	26.53	26.03	27.53	27.03	.....
Philadelphia	25.84	25.34	26.84	26.34	.....
Bethlehem, Pa.	\$25.00	\$24.50	\$26.00	\$25.50	.....
Everett, Mass.	25.00	24.50	26.00	25.50	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....
Steelton, Pa.	.....	24.50	.....	.....	28.50
Birdsboro, Pa.	25.00	24.50	26.00	25.50	28.50
Sparrows Point, Md.	25.00	24.50	.....	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....
Sharpsville, Pa.††	24.00	23.50	24.50	24.00	.....
Buffalo	24.00	23.00	25.00	24.50	28.50
Cincinnati	24.44	24.61	.....	25.11	.....
Canton, Ohio	25.39	24.89	25.89	25.39	.....
Mansfield, Ohio	25.94	25.44	26.44	25.94	.....
St. Louis	24.50	24.02	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	.....
Granite City, Ill.	24.00	23.50	24.50	24.00	.....
Cleveland	24.00	23.50	24.50	24.00	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....
Toledo	24.00	23.50	24.50	24.00	.....
Youngstown††	24.00	23.50	24.50	24.00	.....
Detroit	24.00	23.50	24.50	24.00	.....
St. Paul	26.63	.....	27.13	26.63	.....
Duluth	24.50	.....	25.00	24.50	.....
Birmingham	19.38*	18.00	24.00	.....	.....
Los Angeles, San Francisco and Seattle	27.50	.....	.....	.....	.....
Provo, Utah	22.00	.....	.....	.....	.....
Montreal†	27.50	27.50	.....	28.00	.....
Toronto†	25.50	25.50	.....	26.00	.....

GRAY FORGE

Valley or Pittsburgh fee.....\$23.50

CHARCOAL

Lake Superior fee.....\$27.00
Delivered Chicago 30.34

Base prices are subject to an additional charge for delivery within the switching limits of the respective districts.

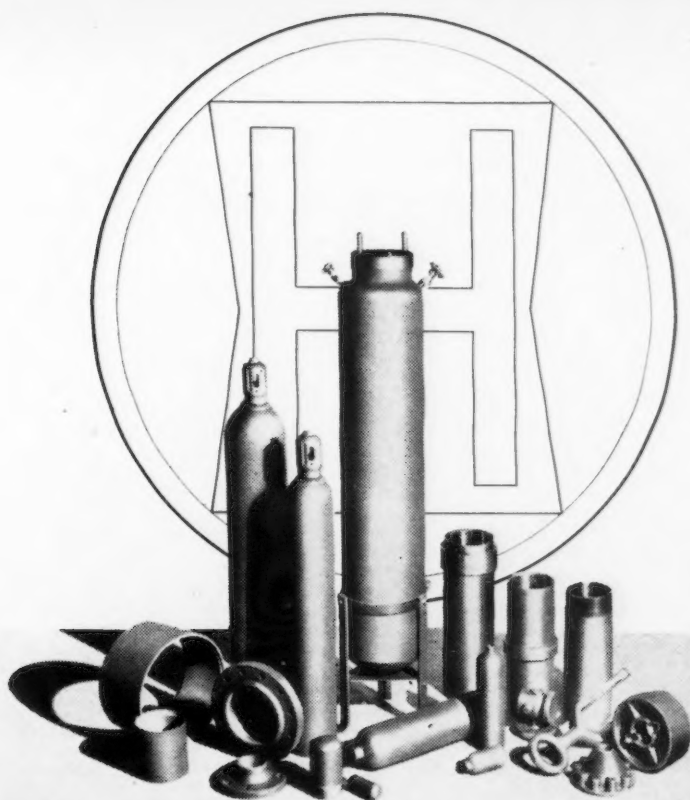
*Delivered prices on Southern iron for shipment to Northern points are 38c. a ton below delivered prices from nearest Northern basing point on iron with phosphorus content of 0.70 per cent and over. †On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

WAREHOUSE PRICES

(Base Prices, Dollars per 100 lb., Delivered Metropolitan Areas)

	Pittsburgh	Chicago	Cleveland	Philadelphia	New York	Detroit	Buffalo	Boston	Birmingham	St. Louis	St. Paul	Milwaukee	Los Angeles
Sheets, hot rolled	\$3.35	\$3.05	\$3.35	\$3.55	\$3.58	\$3.23	\$3.25	\$3.51	\$3.45	\$3.39	\$3.30	\$3.48	\$4.30
Sheets, cold rolled	.....	4.10	4.05	4.05	4.40	4.30	4.30	4.58	.....	4.12	4.35	4.43	6.50
Sheets, galvanized	4.75	4.60	4.62	4.90	5.00	4.64	4.75	5.11	4.75	4.87	4.75	4.98	5.25
Strip, hot rolled	3.60	3.40	3.50	3.95	3.96	3.48*	3.82	3.86	3.70	3.74	3.65	3.73	.....
Strip, cold rolled	3.20	3.30	3.20	3.31	3.51	3.20	3.22	3.26	.....	3.61	3.83	3.54	.....
Plates	3.40	3.55	3.40	3.55	3.76	3.60	3.62	3.85	3.35	3.69	3.80	3.68	4.00
Structural shapes	3.40	3.55	3.58	3.55	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.15
Bars, hot rolled	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	4.15
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300	7.20	7.10	7.55	7.31	7.60	7.42	7.35	7.50	.....	7.72	7.45	7.33	9.40
Bars, ht. rld. SAE 3100	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	.....	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300	8.15	8.15	8.40	8.56	8.84	8.45	8.40	8.63	.....	8.77	8.84	8.38	10.65
Bars, cd. drn. SAE 3100	6.75	6.75	7.75	7.16	7.19	7.05	6.75	7.23	.....	7.12	7.44	6.98	9.80

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb.; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb.; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 150 to 499 lb.; New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, shapes, cold rolled sheets, 300 to 1999 lb., galvanized sheets, 150 to 1049 lb. Extras for size, quality, etc., apply on above quotations. *12 gage and heavier, \$3.23.



The Quality Seal on Seamless Steel

For over three-quarters of a century, Harrisburg has been manufacturing and selling seamless, drop forged, and other steel products to industry throughout the world. Harrisburg's closely-knit and compact organization, backed by a wealth of engineering experience, effects notable economies for its many customers. Harrisburg products are "right" from the start; right

because supervision starts with the steel manufactured in their own open-hearth and ends only at the point of shipment.

★ ★ ★

Harrisburg makes: Alloy and carbon steels, seamless steel cylinders, pipe couplings, pump liners, liquefiers, hollow and drop forgings, pipe flanges, bull plugs and coils and bends.

HARRISBURG STEEL CORPORATION

HARRISBURG

PENNSYLVANIA

Sales Possibilities

... CONSTRUCTION, PLANT EXPANSION AND EQUIPMENT BUYING

North Atlantic States

• **American Steel & Wire Co.**, Worcester, Mass., has let general contract to Lane Construction Co., Meriden, Conn., for one-story addition, 500 x 1050 ft. Cost over \$750,000 with equipment. This is part of modernization and expansion program to be carried out at mill.

General Electric Co., Schenectady, N. Y., has let general contract to Turner Construction Co., 420 Lexington Avenue, New York, for new plant at Everett, Mass., comprising two main one-story units, 400 x 500 ft. and 85 x 300 ft., respectively, for parts manufacture and assembling for supercharger turbine units for War Department. Cost about \$5,873,000, amount to be provided by Government.

Board of Directors, Wentworth Institute, 550 Huntington Avenue, Boston, plans two two-story additions, 50 x 70 ft., and 25 x 54 ft., for machine shops. Cost close to \$70,000 with equipment. Kilham, Hopkins & Greeley, 126 Newbury Street, are architects; and Cleverdon, Varney & Pike, 46 Cornhill Street, engineers.

Berkshire Woolen Co., Pittsfield, Mass., has approved plans for new power house at mill. Cost over \$125,000 with equipment.

United States Engineer Office, Providence, R. I., asks bids until Feb. 25 for new pumping station at West Springfield, Mass.

New Britain Machine Co., New Britain, Conn., screw machine products, will carry out expansion, including additional equipment for production of aircraft engine parts for Navy Department. Fund of \$409,000 will be secured from Government for project.

Ark-Les Switch Corp., 459 Watertown Street, Watertown, Mass., electric switches for automotive service, etc., has let general contract to Louis A. Comeau, 9 Cherry Street, Belmont, Mass., for two-story addition. Cost close to \$50,000 with equipment. C. Francis Roberts, 1400 Hancock Street, Quincy, Mass., is architect.

Production Machine Co., Wells Street, Greenfield, Mass., polishing machinery and parts, plans one-story addition. Cost over \$60,000 with equipment.

American Brake Shoe & Foundry Co., 230 Park Avenue, New York, has let general contract to Austin Co., Cleveland, for four-story addition, 100 x 175 ft., to plant of American Brakeblok Division, Detroit. Cost over \$400,000 with equipment.

Hobart Welding Accessories, Inc., 276 Lafayette Street, New York, has leased one-story building at Steinway and Thirty-sixth Avenues, Long Island City, for plant. Company is an interest of Hobart Brothers Co., Troy, Ohio.

Ford Instrument Co., Inc., Rawson Street, Long Island City, gun fire control instruments, etc., has purchased local plant of White Motor Co., 220,000 sq. ft. of floor space, for expansion.

Continental Can Co., 100 East Forty-second Street, New York, will begin superstructure soon for three-story and basement addition, 100 x 180 ft., to branch plant at Harvey, La., for which general contract recently was let to Austin Co., Cleveland. Cost close to \$200,000 with equipment.

Combined Motors, Inc., 45-25 Thirty-fourth Street, Long Island City, motor trucks and parts, has purchased a one-story building at 43-46 Thirty-seventh Street, and also has leased a one-story building at 47-45 Thirty-first Place, for expansion.

Sterling Engine Co., 1270 Niagara Street, Buffalo, gas and gasoline engines and parts, has let general contract to Frederick T. Williams, 260 Kingsley Street, for one-story addition, about 100,000 sq. ft. of floor space, for

assembling marine engines for Navy Department. Cost about \$500,000 with machinery.

Worthington Pump & Machinery Corp., Clinton and Roberts Streets, Buffalo, has taken out permit for one-story addition, 80 x 175 ft., for which superstructure will proceed at once. Cost close to \$100,000 with equipment.

Fedders Mfg. Co., Inc., 57 Tonawanda Street, Buffalo, automobile radiators and kindred equipment, plans one and multi-story addition, for which bids will be asked soon on general contract. Cost close to \$750,000 with equipment. Robert A. Hill, 74 Niagara Street, is architect.

Simonds Saw & Steel Co., Ohio Street, Lockport, N. Y., has approved plans for one-story addition. Cost close to \$50,000. Main offices are at Fitchburg, Mass.

Breeze Corps., Inc., 35 South Sixth Street, Newark, N. J., fabricated stainless steel and alloy steel products, has leased four-story building at 500-04 Central Avenue, about 52,000 sq. ft. of floor space, previously used by Goodyear Tire & Rubber Co., and will improve for expansion. Present plants will be continued as heretofore.

DeLaval Steam Turbine Co., 853 Nottingham Way, Trenton, N. J., has let general contract to J. W. Ferguson Co., Inc., 152 Market Street, Paterson, N. J., for one-story addition, 100 x 300 ft., for a machine shop. Cost over \$350,000 with equipment.

Wright Aeronautical Corp., 132 Beckwith Avenue, Paterson, N. J., plans expansion in plant at East Paterson, including equipment, production to be used by Navy Department. Appropriation of \$1,500,000 will be secured from Government for project.

Singer Mfg. Co., Elizabethport, N. J., sewing machines and parts, has let general contract to Austin Co., Cleveland, for one-story addition, 200 x 600 ft., for production of equipment for Government. Cost close to \$500,000 with machinery.

Worthington Pump & Machinery Corp., Harrison, N. J., has let general contract to Wigton-Abbott Corp., 60 East Forty-second Street, New York, for one-story addition, 35 x 79 ft., for expansion in welding division. Cost close to \$50,000 with equipment.

Welin Davit & Boat Corp., 500 Market Street, Perth Amboy, N. J., power boats, marine equipment, etc., plans one-story addition, about 22,500 sq. ft. of floor space, on adjoining tract, 100 x 586 ft. Cost over \$65,000 with equipment.

Brewster Aeronautical Corp., 6 East Forty-fifth Street, New York, airplanes and parts, will have plans prepared by Silverman & Levy, Architects' Building, Philadelphia, architects, for new plant at Hatboro, Pa. Main unit will be one-story, about 600 x 600 ft., with smaller structures, for assembling fighter and bomber type planes. Cost close to \$2,000,000 with equipment.

Empire Ordnance Corp., South Franklin and Horton Streets, Wilkes-Barre, Pa., an interest of Vulcan Iron Works, same address, has let general contract to Sordoni Construction Co., Forty-Fort, Pa., for extensions and improvements for foundry and other service. Cost close to \$50,000 with equipment.

National Munitions Co., Inc., recently organized subsidiary of National Powder Co., Inc., Eldred, Pa., has acquired about 300 acres fronting on Allegheny River, for new one-story plant for shell-loading and fuze-assembling for Government. Cost over \$200,000 with equipment.

Cooper-Bessemer Corp., Grove City, Pa., gas and oil engines and parts, compressors, etc., has let general contract to Austin Co., Cleveland, for one-story addition, 75 x 280 ft., with one-story wing extension, about 20 x 200 ft., primarily for a machine shop. Cost over \$175,000 with equipment.

Sommerfeld Machine Co., Braddock, Pa., gears and kindred equipment, is erecting one-story addition, 30 x 150 ft., for which general contract recently was awarded to Uhl Construction Co., 6001 Butler Street, Pittsburgh. Cost over \$50,000 with equipment.

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 25 for pipe vises, machinists' vises, wrenches, compass saw, files, diestocks, pruning shears, hacksaw frames, bench grinders, tinners' snips, ship scrapers, combination pliers, hammers, sledge hammers, machinists' hammers, shovels, hatchets and other equipment (Schedule 4812).

Bethlehem-Fairfield Shipyard, Inc., Baltimore, recently organized interest of Bethlehem Steel Co., Shipbuilding Division, 1101 Key Highway, plans new shipbuilding plant for construction of vessels for United States Maritime Commission, consisting of 13 shipways, outfitting dock, shops and other structures. Cost about \$7,838,000. Fund in that amount has been authorized by Government for project.

Construction Service, Veterans' Administration, Washington, asks bids until March 23 for boilers and other boiler plant equipment, boiler house and radial brick stack, air-conditioning equipment, refrigerating machinery and other equipment for institution at Fort Howard, Md., in conjunction with other buildings, for which bids are being asked at same time.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 25 for screw-cutting precision lathes (Schedule 5302); until Feb. 28 for heavy-duty engine lathes (Schedule 5315), radial drilling machine (Schedule 5316) for Eastern and Western yards.

General Electric Co., Pittsfield, Mass., plans construction of a storage building at its local plastics plant, containing about 10,000 sq. ft. of floor space. It will be used for storage of compound materials for Pittsfield, Meriden, Conn., and Fort Wayne, Ind., plants.

The South

• **Reynolds Metals Co., Inc.**, Federal Reserve Bank Building, Richmond, Va., plans new works at Lister, Ala., including rolling mills and other structures for production of aluminum shapes for aircraft manufacture. Cost over \$5,000,000 with machinery. Project will be carried out in name of Reynolds Alloys Co., Inc., recently organized subsidiary, and will supplement aluminum production plant of parent company at same place, on which work is now in progress, and which will be source of supply for raw material for structural shape division. Entire project will represent investment of \$17,500,000, fund to be furnished by Government.

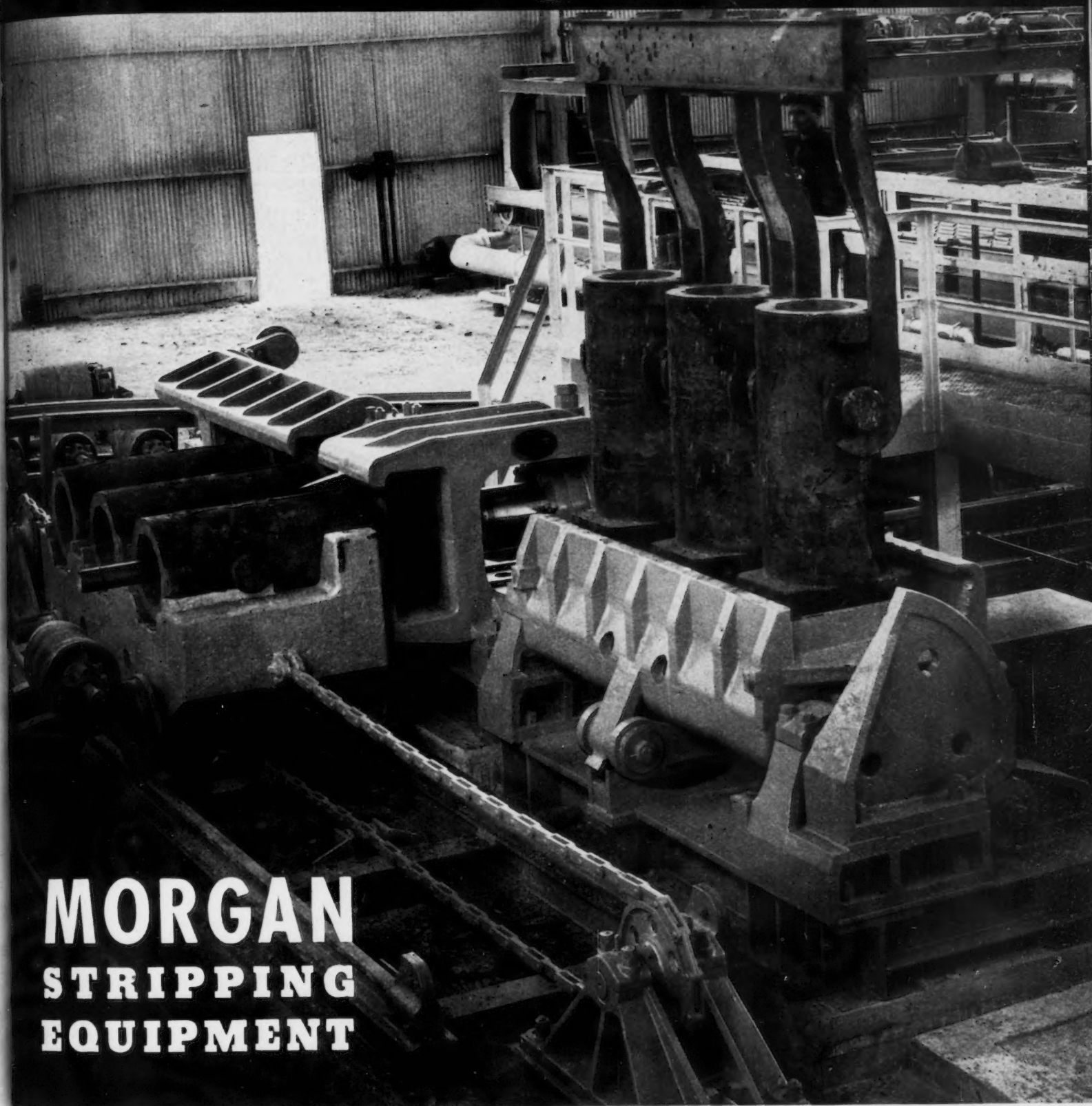
Schenley Distillers Corp., Frankfort, Ky., has let general contract to Frank Messer & Sons, Inc., 2515 Burnett Avenue, Cincinnati, for five-story addition, 150 x 154 ft., for storage and distribution. Cost over \$200,000 with equipment. Main offices are at 350 Fifth Avenue, New York.

Jackson Brewing Co., 620 Decatur Street, New Orleans, has asked bids on general contract for one and two-story additions, and improvements in present building. Cost over \$50,000 with equipment. Carl E. Olschner, Carondelet Building, is architect; Jens B. Jensen, American Bank Building, is consulting engineer.

United States Treasury, State Procurement Office, Liberty Life Building, Columbia, S. C., asks bids until Feb. 24 for hard copper tubing, gate valves, plugs, couplings, etc. (Circular 26604).

E. I. du Pont de Nemours & Co., Inc., Smokeless Powder Division, Wilmington, Del.,

BUILT BY **MORGAN** *Engineering*



MORGAN **STRIPPING** **EQUIPMENT**

Above is shown equipment for stripping alloy hot top ingots, consisting of two hydraulically operated ingot mold tilting machines, one 100-ton hydraulic stripper, and one mold car, all controlled by one operator. • Molds with ingots are transferred three at a time from pouring platform by multiple hook crane bale to mold

tilter, are locked in position and tilted onto transfer car. • The ingot car conveys molds to stripper where they automatically engage with stripper head and are stripped, one at a time, to conveyor table. • After stripping, the molds are moved to second tilter to be returned to original upright position for removal to pouring platform.

★ **DESIGNERS • MANUFACTURERS • CONTRACTORS**
BLOOMING MILLS • PLATE MILLS • STRUCTURAL MILLS
★ ELECTRIC TRAVELING CRANES • CHARGING MACHINES
INGOT STRIPPING MACHINES • SOAKING PIT CRANES
★ ELECTRIC WELDED FABRICATION • LADLE CRANES
STEAM HAMMERS • STEAM HYDRAULIC FORGING
★ PRESSES • SPECIAL MACHINERY FOR STEEL MILLS
THE MORGAN ENGINEERING CO., Alliance, Ohio

Pittsburgh, 1420 Oliver Building

will begin work soon on new smokeless powder plant at Childersburg, Ala., for production for War and Navy Departments, using part of tract recently acquired by Government. It will include loading and distribution facilities, machine and mechanical shops, power house and other structures. Fund of \$47,997,000 has been authorized by Government for project.

Virginia Electric & Power Co., Richmond, Va., plans addition to steam-electric generating plant at Norfolk, Va., with installation of new turbine-generator unit and accessories, high-pressure boilers and auxiliary equipment. Cost close to \$4,100,000.

Cyclone Fence Co., 1308 East Lancaster Avenue, San Antonio, Tex., steel wire fencing, posts, etc., plans one-story addition, 160 x 160 ft., for expansion in production, storage and distribution. Cost over \$80,000 with equipment; also plans new office building. Main offices are at Waukegan, Ill.

Diamond Alkali Co., Oliver Building, Pittsburgh, has acquired tract at South Lamar and Lenway Streets, Dallas, Tex., for new branch plant, with machine shop, power house and other structures. Rust Engineering Co., Clark Building, Pittsburgh, is contractor. Cost over \$500,000 with machinery. Company recently has organized Diamond Alkali Co. of Texas, Inc., 1006 Main Street, Houston, Tex., to take over Gulf Coast Chemical Co., last noted address, and operate new plant.

Central States

• **United Aircraft Products, Inc.**, 480 East Huffman Avenue, Dayton, Ohio, plans expansion in local plant, including buildings and equipment. Similar program will be carried out at branch plant at Los Angeles, entire project to cost about \$850,000. Financing in that amount will be arranged soon.

Ferro Machine & Foundry Co., 3155 East Fifty-sixth Street, Cleveland, engine cylinders and other engine castings, has let general contract to Bolton-Pratt Construction Co., 1276 West Third Street, for one-story addition, 95 x 110 ft. Cost over \$60,000 with equipment. Wallace H. Hatch, Hippodrome Building, is architect.

C. Tennant & Sons Co., 9 Rockefeller Plaza, New York, locking metal straps for shipping containers and kindred metal specialties, has acquired property of Frost Fence Co., Warren, Ohio, and will expand for new branch works, including three one-story additions for machine shop, storage and distributing building and office. Company will remove Griplock Division from Farrell, Pa., to new location and increase capacity.

Burt Mfg. Co., 44 East South Street, Akron, Ohio, oil filters, ventilators, etc., has awarded contract to Austin Co., Cleveland, for one-story addition. Cost about \$60,000 with equipment.

Monarch Machine Tool Co., Sidney, Ohio, lathes, etc., will begin superstructure for one-story addition, for which general contract recently was let to Murray Ferguson, Sidney. Cost close to \$100,000 with equipment. Schenck & Williams, Third National Bank Building, Dayton, Ohio, are architects.

Challenge Gauge & Tool Co., 560 North Elder Street, Indianapolis, plans one-story addition, 22 x 120 ft. Cost close to \$50,000 with equipment. E. C. Doeppers, Rauh Building, is engineer.

Curtiss-Wright Co., Inc., Propeller Division, 30 Rockefeller Plaza, New York, has asked bids for modernizing four-story building on West Morris Street, Indianapolis, recently acquired for branch plant. Cost over \$250,000 with equipment. Lennox & Matthews, Architects' and Builders' Building, Indianapolis, are architects.

General Engineering & Mfg. Co., 1523 South Tenth Street, St. Louis, special machinery and parts, plans two-story addition, 30 x 115 ft. Cost close to \$60,000 with equipment. Joseph Bungert, 617 Wainwright Building, is architect.

Goodyear Tire & Rubber Co., Akron, Ohio, has leased one-story and basement building, about 55,000 sq. ft. of floor space, to be

erected by North Kansas City Development Co., Railway Exchange Building, Kansas City, Mo., at North Kansas City, for new factory branch, storage and distributing plant. Cost over \$100,000 with equipment. Erection contract has been let to Hiram Elliott Construction Co., Pioneer Trust Building, Kansas City; Keene & Simpson, Land Bank Building, are architects.

McDonnell Aircraft Corp., Lambert-St. Louis Municipal Airport, St. Louis, is arranging for lease of additional land for one-story addition for aircraft production. Cost over \$150,000 with equipment.

Ford Motor Co., Dearborn, Mich., has engaged Albert Kahn Associated Architects & Engineers, Inc., Detroit, to prepare plans for one-story plant at River Rouge works, about 1,000,000 sq. ft. of floor space, for production of medium-sized bomber airplanes, including parts manufacture and assembling. Cost over \$6,500,000 with equipment.

Kermath Mfg. Co., 5890 Commonwealth Avenue, Detroit, marine engines and parts, plans two-story addition. Cost close to \$65,000 with equipment. Wiedmaier & Gay, 112 Madison Avenue, are architects.

Pontiac Motor Division, General Motors Corp., Pontiac, Mich., has let general contract to Austin Co., Cleveland, for one-story addition to foundry, for expansion in cleaning department. Cost close to \$100,000 with equipment.

Detroit Bevel Gear Co., 8130 Joseph Campeau Avenue, Detroit, has let general contract to R. H. Hidey, Inc., 270 St. Aubin Street, for new one-story plant in Hamtramck district. Cost about \$50,000 with equipment.

Vanadium Alloys Steel Co., 5221 Trumbull Street, Detroit, has engaged Austin Co., Curtis Building, and Cleveland, to design and erect new one-story storage and distributing plant, 100 x 250 ft., at Plymouth, Mich. Cost over \$85,000 with mechanical-handling and other equipment.

Arthur J. O'Leary & Son Co., 5757 West Sixty-fifth Street, Chicago, bolts, nuts, fabricated steel products, etc., has let general contract to Abell-Howe Co., 53 West Jackson Boulevard, for one and two-story addition, 125 x 200 ft., for expansion in fabricating division. Cost over \$125,000 with equipment.

Verson Allsteel Press Co., 1355 East Ninety-third Street, Chicago, hydraulic and mechanical presses, parts, etc., plans one-story addition, 60 x 500 ft. Cost over \$150,000 with equipment.

Woodward Governor Co., 216-18 Mill Street, Rockford, Ill., governors for hydraulic turbines and kindred products, has let general contract to Midland Constructors, Inc., 205 West Wacker Drive, Chicago, for one-story addition, 220 x 226 ft., and 90 x 390 ft., with two-story center section, 80 x 80 ft. Cost close to \$175,000 with equipment. Harza Engineering Co., 208 West Wacker Drive, Chicago, is consulting engineer.

City Council, Greensfield, Iowa, asks bids until March 4 for expansion and improvements in municipal power plant, including 600 to 700-hp. diesel engine-generator unit and accessories, exciter, air filter, day oil storage tank, etc., Stanley Engineering Co., Muscatine, Iowa, is consulting engineer.

Bureau of Reclamation, Denver, asks bids until Feb. 25 for single-motor, fixed-hoist overhead traveling crane for installation in hoist house at outlet works at Green Mountain Dam, Colorado-Big Thompson project, Colo. (Specifications 1476-D).

General Steel Castings Corp., Granite City, Ill., has approved plans for one-story addition to heat-treatment division. Cost over \$150,000 with equipment.

Western States

• **Cadmium & Nickel Plating Co.**, 805 South Hooper Avenue, Los Angeles, has asked bids on general contract for one-story addition, 119 x 120 ft. Cost over \$70,000 with equipment. Edwin F. Rudolph, 132 First Street, is consulting engineer.

Los Angeles Bureau of Power and Light, 205 South Broadway, Los Angeles, will take

bids at once for two new service and repair, equipment and headquarters buildings at 3237 Artesian Street and 1400 South Sepulveda Boulevard, respectively, each to comprise a main one and two-story structure, 50 x 190 ft., and two one-story smaller units. Cost about \$90,000 and \$75,000 with equipment, in order noted.

General Engineering & Drydock Co., 1807 Clement Avenue, Alameda, Cal., has let general contract to Christensen & Lyons Construction Co., 2009 Pacific Avenue, Oakland, Cal., for one-story addition for a machine shop. Cost close to \$70,000 with machinery.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 25 for 25 gasoline engine-driven portable pumps and spare parts for Mare Island Navy Yard (Schedule 5263); six boat crane winches for tapping and spare parts for Puget Sound yard (Schedule 5278).

California Shipbuilding Co., Los Angeles, care of Bechtel-McCone-Parsons, Inc., 601 West Fifth Street, engineer, recently organized, has let general contract to E. S. McKittrick Co., 7839 Santa Fe Avenue, for one-story mold loft and shop, 150 x 350 ft., at new shipbuilding plant on West Basin, Los Angeles harbor. Cost close to \$125,000 with equipment. This is first of series of shops and construction buildings. Yard will comprise eight shipways, on which construction will begin soon. Entire project will cost about \$5,000,000. Todd Shipyards Corp., 1 Broadway, New York, is interested in new company.

General Cable Corp., Sixty-second and Green Streets, Emeryville, Cal., has let general contract to George A. Fuller Co., 408 South Spring Street, Los Angeles, for new one-story plant, 100 x 300 ft. Cost over \$150,000 with equipment. Will G. Corlett, Bank of America Building, Oakland, Cal., is architect. Main offices are in New York.

Canada

• **Ontario Forgings, Ltd.**, Wilcox Street, Hamilton, Ont., has asked bids on general contract for one-story addition. Hutton & Souter, Piggott Building, are architects.

General Motors of Canada, Ltd., Oshawa, Ont., has let general contract to H. A. Wickett Co., Ltd., 156 Front Street East, Toronto, for one-story addition for expansion in tool and die department. Cost over \$65,000 with equipment. Award also has been made to Chestnut-MacGregor, Ltd., 56 Bloor Street West, Toronto, for modernization in two existing buildings at plant. Cost about \$50,000.

Way Sagless Spring Co., Ltd., 48 Abell Street, Toronto, bed springs, etc., has leased one-story building to be erected by Yaltes & Rotenberg Co., Ltd., 372 Bay Street, for plant, expanding present capacity. Cost over \$100,000 with equipment. Kaplan & Sprachman, 305 Dundas Street West, are architects.

Department of Munitions and Supply, Ottawa, C. D. Howe, minister, is having plans prepared for addition to munitions plant at Du Palais Hill, Quebec, to cost about \$5,000,000.

Allied War Supply Corp., Ltd., 429 Lagachetiere Street West, Montreal, has awarded general contract to Angus Robertson, Ltd., 660 St. Catharine Street West, for munitions plant in Province of Quebec, to cost \$10,000,000.

Hayest Steel Products, Ltd., Merritton, Ont., has plans by A. E. Nicholson, architect, 46 Queen Street, St. Catharines, Ont., for plant addition, to cost about \$75,000 with equipment.

Link Belt, Ltd., 791 Eastern Avenue, Toronto, has plans by Ewart, Armer & Byam, engineers, 36 Toronto Street, for plant addition, to cost about \$100,000 with equipment.

Federal Foundries & Steel Co., Ltd., 80 King Street West, Toronto, will take over plant of London Rolling Mills, London, Ont., which will be remodeled and new equipment installed at cost of about \$100,000.

Dominion Engineering Works, Ltd., First Avenue, Lachine, Que., machinery, tools, etc., has awarded general contract to Atlas Construction Co., Ltd., 679 Belmont Street, Montreal, for plant addition at Longueuil, Que., to cost about \$250,000.